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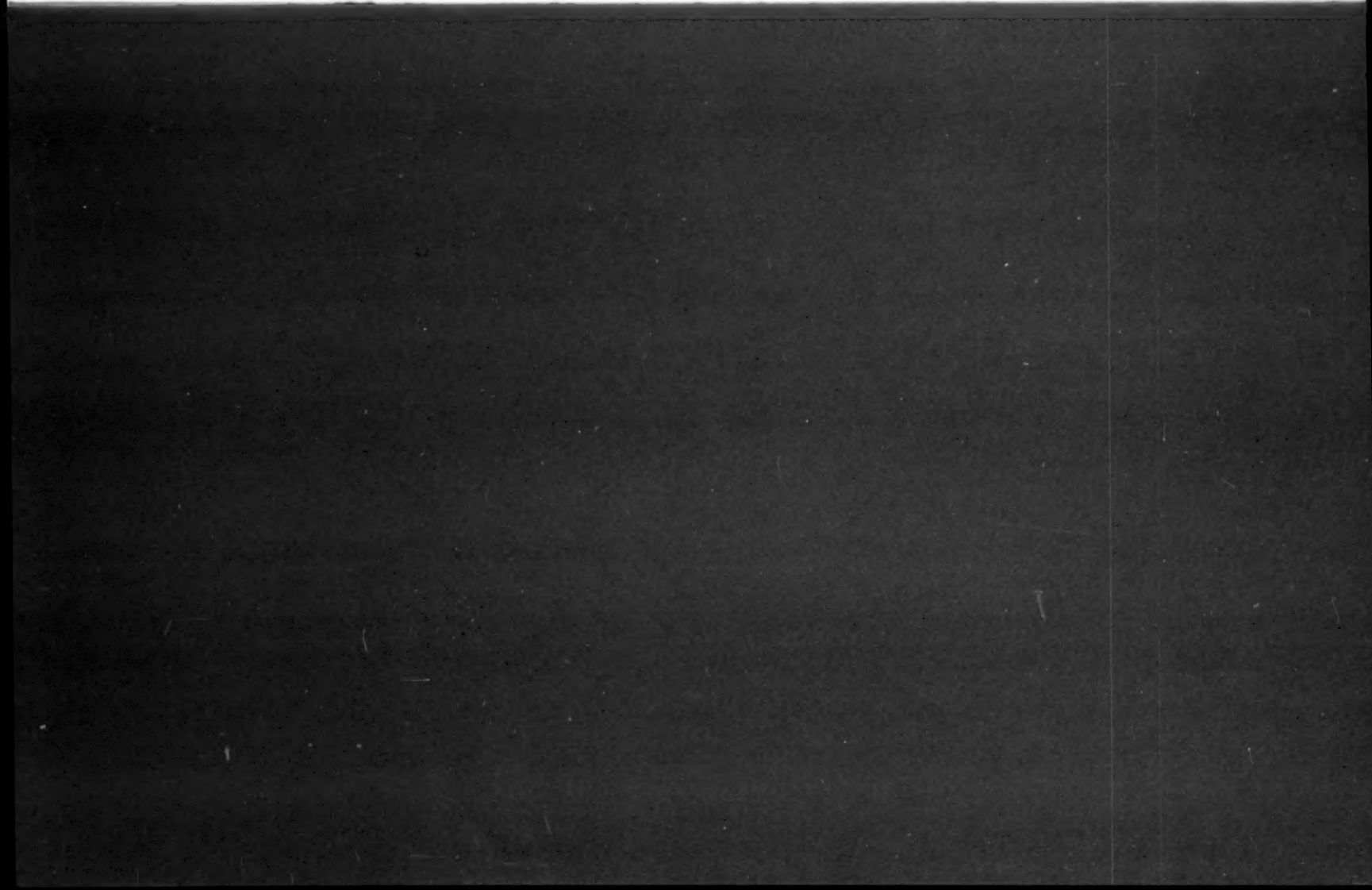

OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

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PATENT AND TRADEMARK OFFICE NOTICES

National Inventors Day

The Patent and Trademark Office will be observing National Inventors Day in the Public Search Room on Saturday, February 5 from 1:00 p.m. to 5:00 p.m. and Sunday, February 6, 1977 from 10:00 a.m. to 5:00 p.m. The public is invited to view the exhibits on these days and to attend a formal program at 2:00 p.m. on Sunday.

In order to accommodate the exhibits, it will be necessary to close the Public Search Room at 5:00 p.m. on Friday, February 4, 1977.

We would appreciate the cooperation of all users of the Search Room facilities in removing all personal items and belongings in order to permit the early closing time.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Jan. 17, 1977.

Recombinant DNA

Accelerated Processing of Patent Applications for Inventions

In recent years revolutionary genetic research has been conducted involving recombinant deoxyribonucleic acid ("recombinant DNA"). Recombinant DNA research appears to have extraordinary potential benefit for mankind. It has been suggested, for example, that research in this field might lead to ways of controlling or treating cancer and hereditary defects. The technology also has possible applications in agriculture and industry. It has been likened in importance to the discovery of nuclear fission and fusion. At the same time concern has been expressed over the safety of this type of research. The National Institutes of Health (NIH) has released guidelines for the conduct of research concerning recombinant DNA. "Guidelines for Research Involving Recombinant DNA Molecules," published in the Federal Register of July 7, 1976, 41 F.R. 27902–27943. NIH is sponsoring experimental work to identify possible hazards and safety practices and procedures.

In view of the exceptional importance of recombinant DNA and the desirability of prompt disclosure of developments in the field, the Assistant Secretary of Commerce for Science and Technology has requested that the Patent and Trademark Office accord "special" status to patent applications involving recombinant DNA. Upon appropriate request, the Office will make special patent applications for inventions relating to recombinant DNA, including those that comtribute to safety of research in the field. Requests for special status should be written, should identify the application by serial number and filing date, and should be accompanied by affidavits or declarations under 37 CFR 1.102 by the applicant, attorney or agent explaining the relationship of the invention to recombinant DNA research. Requests also must include a statement that the NIH guidelines cited above or as amended in the future are being followed in any experimentation in this field, except that the statement may include an explanation of any deviations considered essential to avoid disclosure of proprietary information or loss of patent rights. The requests will be handled in the same manner as requests to make applications special that relate to energy or environmental quality. See Manual of Patent Examining Procedure 708.02.

Dated: Jan. 7, 1977.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Approved: January 10, 1977.

BETSY ANCKER-JOHNSON,
Assistant Secretary for Science and Technology.

[FR Doc.77-1155; Filed 1-12-77; 8:45 am]

TITLE 37—PATENTS, TRADEMARKS AND COPYRIGHTS

Chapter I—Patent and Trademark Office, Department of Commerce

[37 CFR Parts 1, 3 and 5]

IMPLEMENTATION OF PATENT COOPERATION TREATY

Notice of Proposed Rulemaking

Notice is hereby given that, pursuant to the authority contained in Section 6, Title 35 of the United States Code, and Pub. L. 94–131, 89 Stat. 685, of November 14, 1975 which will come into force on the same day as the entry into force of the Patent Cooperation Treaty, the Patent and Trademark Office proposes to amend Title 37 of the Code of Federal Regulations by either amending or revising sections 1.1, 1.4, 1.5, 1.8, 1.12, 1.14, 1.21, 1.23, 1.25, 1.26, 1.52, 1.55, 1.57, 1.58, 1.72, 1.75, 1.77, 1.78, 1.81, 1.83, 1.84, 1.104, 1.141, 1.146, 1,331, 5.1, 5.3, 5.11, 5.14, 5.15 and 5.17; and by adding new sections 1.9, 1.61, 1.70, 1.318, 1.401, 1.412, 1.413, 1.414, 1.415, 1.421, 1.422, 1.423, 1.424, 1.425, 1.431, 1.432, 1.433, 1.434, 1.435, 1.436, 1.437, 1.438, 1.445, 1.446, 1.451, 1.455, 1.461, 1.465, 1.468, 1.471, 1.475, 1.481, 1.482, 3.56 and 3.57.

In view of the approaching entry into force of the Patent Cooperation Treaty, the Patent and Trademark Office is proposing certain amendments to the rules of practice in patent cases, forms for patent cases and the rules relating to secrecy of certain inventions and licenses to file applications in foreign countries. These proposed rules provide for the formal acceptance of international applications filed under the Patent Cooperation Treaty in the Patent and Trademark Office as a Designated Office, establish processing fees for international applications, clarify procedures before the Receiving Office and International Search Authority, and provide for other matters relating to the filing and processing of international applications.

All persons are invited to present their views, objections, recommendations or suggestions relating to the proposed rule changes to the Commissioner of Patents and Trademarks, Washington, D.C. 20231 on or before May 26, 1977 on which date a hearing will be held at 9:30 a.m. in Room 11C24, Building 3, 2021 Jefferson Davis Highway, Arlington, Virginia. All persons wishing to be heard orally at the hearing are requested to notify the Commissioner of Patents and Trademarks of their intended appearance. All comments received will be available for public inspection in Room 11E10 of Building 3, at 2021 Jefferson Davis Highway, Arlington, Virginia. If the Patent Cooperation Treaty implementation schedule permits the period for comments may be extended. It is also possible that a further draft will be published for comment.

The proposed rules will not be promulgated until the Patent Cooperation Treaty and Public Law 94–131, 89 Stat. 685 come into force. This will occur three months after the necessary eight ratifications or accessions to the Treaty have occurred, four of which must be countries with major patent activity, PCT Article 63. The United States of America and the Federal Republic of Germany are two of the four major countries which have ratified the Treaty. Two additional major countries must yet ratify or accede to the Treaty before it can enter into force.

This proposal has been reviewed pursuant to E.O. 11821 and OMB Circular A–107 and determined to have no major inflationary impact.

The Patent Cooperation Treaty was published in the OFFICIAL GAZETTE on July 14, 1970 at 876 O.G. 341–388. The implementing legislation, Public Law 94–131, was published in the OFFICIAL GAZETTE on January 6, 1976 at 942 O.G. 177–185. The latest draft of the Administrative Instructions to be promulgated under Rule 89 of the Treaty by the World Intellectual Property Organization is being published in an OFFICIAL GAZETTE in January of 1977.

The following comments are directed to the proposed changes and additions in the Patent Rules of Practice.

In order to distinguish which rules apply to national applications, which to international applications, and which to both, it is being proposed that Part I of 37 CFR be divided into 3 subparts. Subpart A would relate to "General Provisions" directed to both national applications and international applications and would include §§ 1.1 through 1.26. Subpart B would relate to "National Processing Provisions" directed to national applications only, and would include §§ 1.31 through 1.352. Subpart C would relate to "International Processing Provisions" under the Patent Cooperation Treaty and would include proposed new §§ 1.401 through 1.482. Within each subpart, where an exception as to the applicability of a rule to national and/or international applications occurs, a specific clarifying reference has been added. In all cases, the present numbering of rules has been maintained.

Section 1.1 provides a special "Box PCT" address to permit an early separation and routing of PCT related mail from other types of mail.

Section 1.4(a) is amended to refer to the added rules relating to international processing.

Section 1.5(a) is amended to indicate that international applications are to be identified by their international application numbers.

Section 1.8(a) is amended to exclude international applications and papers relating thereto from the certificate of mailing procedure.

New section 1.9 is added to distinguish between the terms "national application" and "international application" as used in these rules.

Section 1.12 is amended to refer specifically to the international application number.

Section 1.14(a) indicates the current practice as to application secrecy and also refers specifically to applications identified in international applications. Section 1.14(c) changes the reference from Atomic Energy Commission to the Energy Research and Development Administration.

An international-type search will be made in all national applications as indicated in § 1.104(c). New paragraph (w) to § 1.21 adds a fee to cover the cost of preparing an international-type search report where desired (PCT Art. 15(5)), although it is not required by the United States Patent and Trademark Office.

Section 1.23 includes a reference to international application processing fees to clearly indicate that such fees must be paid in United States currency.

Section 1.25(b) is amended to indicate that international application fees may be charged against deposit accounts.

Section 1.26 is amended to provide for refunding some portion of the international search fee during subsequent national examination where the prior art search is wholly or partly based on the earlier international search. The amount of the refund will be determined by the examiner in a manner similar to that indicated in the remarks directed to § 1.446 below. Such a refund will tend to make applicants' cost of using the PCT about the same regardless of whether the national or international application is filed initially.

In section 1.52, paragraphs (a) and (b) are amended to permit an application complying with the formal requirements of PCT Rule 11 to be formally acceptable as a national application. International applications arriving in the Patent and Trademark Office as a Designated Office under 35 U.S.C. 371 will be in PCT format and with the changed wording of this rule, will also be formally acceptable for national patentability examination.

Section 1.55 is amended to contain an additional paragraph (d) which states the position set forth in PCT Art. 11(3) and 35 U.S.C. 363 that the international filing date is in effect the national filing date except for the reservation under PCT Art. 64(4). This reservation was taken by the United States of America at the time it deposited its instrument of ratification.

Section 1.57 is amended to indicate that the signature on the Request of an international application will be accepted as the signature on the application.

Section 1.58 is amended slightly to remove any conflict with the formal requirements of the Patent Cooperation Treaty.

Section 1.61 is a new section which relates to the filing of an international application with the Patent and Trademark Office as a Designated Office for national patentability examination (35 U.S.C. 371). These requirements differ somewhat from those applying to the regular filing of national applications.

Section 1.70 is a new section which sets forth the requirements of an oath or declaration under 35 U.S.C. 371(c)(4).

Section 1.72 is amended to indicate that the abstract must be located on a separate sheet of paper. This change has been introduced in order to assure uniformity in information placement in international and regular applications that will aid in patent printing. Except for this change, national applications may continue to be filed in the present format.

Section 1.75, paragraph (e), is amended to provide for multiple dependent claims (PCT Rule 6.4). Paragraphs (f) and (g) have been added to incorporate current practice not previously stated in the rules.

Sections 1.77 and 1.78 have been amended to indicate the preferred order of arrangement of application elements including placement of the abstract after the claims as in PCT Art. 3(2) and Section 208 of the Administrative Instructions.

Section 1.81 is amended to reflect the changes made in 35 U.S.C. 113 by Public Law 94–131 and to comply with PCT Rule 7.2.

Section 1.83 has been amended to remove the mandatory requirement that the drawing show every feature claimed. Such illustrations, however, continue to be strongly preferred and are absolutely essential where necessary for the understanding of the invention.

Section 1.84, which relates to the formal requirements for drawings, has been amended to provide for two alternative drawing sizes. One size is that currently in use and the other is the A4 size required by PCT Rule 11. However, all drawings in a particular application must be of the same size. Other changes have been incorporated to take into consideration the requirements of PCT Rule 11.

Section 1.104 is amended to include a new paragraph (c) relating to the international-type search. Note PCT Art. 15(5) and PCT Rule 41.

Section 1.141 has been amended to provide for including in a single application, inventions so linked as to form a single general inventive concept as in PCT Rule 13.1–13.3.

The rules for determining which inventions can be grouped together in a single application are more liberal in certain respects under the Patent Cooperation Treaty than they are currently in 37 CFR 1.141–1.146. The proposed amendment to Section 1.141 extends the more liberal practice, which a Designated Office is required to apply to national applications that have been initially filed as international applications, to all national applications. Paragraph (a) removes the limit of five species of an invention. Paragraphs 1.141(c)(i) and (ii) generally include the wording of PCT Rule 13.2. Paragraphs 1.141(c)(i) and (d), taken together, state that an application may include, in addition to an allowable independent claim to a product, *one* independent claim to *one* process specially adapted for the manufacture of the product as well as *one* independent claim for *one* use of the product. Paragraphs 1.141(c)(ii) and (d), taken together state that an application may include, in addition to an allowable independent claim for a given process, one independent claim for one apparatus or means for carrying out the process. Such claims drawn to product, process of manufacture, process of use, or apparatus, are considered to be claims to different categories. Paragraph 1.141(e) includes generally the wording of PCT Rule 13.3 and is limited to applications where all of the claims are drawn to only one category.

Section 1.146 follows the revised wording of section 1.141 by removing the limit of five species and also removes the reference to a search of the generic claims.

Section 1.318 is a new section relating to the Office's notifying the International Bureau of the publication of a United States patent based on an unpublished international application in accordance with PCT Rule 48.5.

Paragraphs (a) and (c) of section 1.331 are amended to provide for recording of assignments of international applications which designate the United States of America.

Sections 1.401–1.482 relate to processing of international applications during the international processing stage when the United States Patent and Trademark Office acts as a Receiving Office, International Searching Authority or a Designated Office prior to the acceptance of the international application as a national application for regular patentability examination.

Section 1.401 defines various expressions used in later rules.

Section 1.412 defines those applicants for which the United States Patent and Trademark Office will act as a Receiving Office and also sets forth the major functions of a Receiving Office.

Section 1.413 states that the United States Patent and Trademark Office will act as an International Searching Authority, subject to special agreement and appointment by the Assembly, and indicates some of the major functions thereof.

Section 1.414 states the conditions under which the United States Patent and Trademark Office will act as a Designated Office and defines the functions of the Office as a Designated Office.

Section 1.415 is included to clearly define the authority acting as the International Bureau.

Section 1.421 indicates who may file an international application with the United States Receiving Office.

Sections 1.422, 1.423 and 1.425 are similar to present §§ 1.42, 1.43 and 1.47 and have been added to indicate situations where a person other than the inventor may file an international application designating the United States. These situations include those where the inventor is dead, insane or legally incapacitated, cannot be found or reached, or refuses to sign.

Section 1.431 defines the requirements of an international application filed in the United States Receiving Office.

Section 1.432 relates to the designation of States and the payment of designation fees.

Section 1.433 indicates that only one copy of an international application need be filed and refers to those provisions of the Treaty and Administrative Instructions relating to the physical requirements for international applications.

Section 1.434 relates to the Request portion of an international application.

Section 1.435 calls attention to the PCT Rules relating to the description and also provides that international applications designating the United States must contain an indication of the "best mode" (PCT Rule 5.1(a)(v)).

Section 1.436 refers to the portions of the Treaty and its Regulations which relate to claims.

Section 1.437 relates to the drawings and includes reference to the procedure for receipt of late drawings.

Section 1.438 refers to the abstract requirements of an international application.

Section 1.445 sets forth the fees charged by the Patent and Trademark Office for processing international applications. The amounts of the fees are tentative. More complete and updated studies will be made before these rule changes are finally promulgated and the amounts of the fees will be adjusted accordingly. The fees will be set to reflect 100% recovery of actual cost.

Section 1.446 relates to refund of international application processing fees. It should be noted that since an international-type search will be made in prior filed U.S. national applications or, if an international search made in an international application by the International Searching Authority of Washington is followed by a national examination on such an application, a substantial portion of the international search fee (37 CFR 1.445(a)(2)) could be refunded in many instances. This refund will reduce PCT filing costs.

The examples use the maximum refund and should therefore not be considered to be typical for all applications.

	(A) National application filed first	(B) International application filed first
National filing fee for national application 35 U.S.C. 41)	$65	
Transmittal fee (§ 1.445(a)(1))	35	$35
International fees:		
Basic fee (PCT Rule 15.2(a))	45	45
Designation fees, 3 countries (PCT Rule 15.2(b)(i))	36	36
Search fee (§ 1.445(a)(2))	300	300
(Search fee refund based on international type search § 1.446.)	(−270)	
National filing fee (§ 1.445(a)(4))		65
(Refund of search fee based on savings at national stage (§ 1.26))		(−$270)
Net international processing fees	146	146

The first fee column, labeled (A), relates to a situation where an applicant first files his national application in the Patent and Trademark Office and later, within the priority year, decides to file an international application with the same claims and designates 3 foreign countries. The total fees for the international application in the example would be $416. However, since the claims are the same as those in the national application in which the Office previously made an international-type search, a refund of $270 would be made as indicated in the table below. This would result in the PCT route fees actually costing the applicant $146.

The second fee column, labeled (B), relates to a situation in which the applicant files his international application initially and designates the United States of America as one of the Designated States. Here again the international application fees would be $416. Subsequently, not later than at the expiration of 20 months from the priority date (in this example the international filing date, PCT Art. 2(xi)(c)), the applicant must pay his national fees in the Designated Offices (PCT Art. 22.1). The Patent and Trademark Office, as a Designated Office, may refund during patentability examination a portion of the international search fee under § 1.26. This practice will result in the total cost to the applicant being about the same regardless of whether the national or international application is filed first.

The following table is a draft of the criteria which the examiners may use to determine the amount of the international search fee which may be refunded as a result of an earlier international-type search. Similar criteria will be used for refunds under § 1.26. Current plans are to have the examiner making the international search merely indicate which category most nearly describes the situation in the application under consideration.

CRITERIA FOR REFUND

	Refund percentage of search fee	Refund based on $300 search fee
A. The prior international-type search was so complete that only an updating search was required	90	$270
B. The prior international-type search was directed to substantially the same invention. However, the claims in the international vary from the national application so that a search in at least one additional subclass but less than three additional subclasses is required	70	210
C. The prior international-type search was such that about a half of the search time of the international search was saved	40	120
D. The prior international-type search was of only small value. The claims of the international application were so different from the claims in the prior national application that the search of only a few subclasses was saved	25	75
E. The prior international-type search was of no value	0	(1)

[1] No refund.

Section 1.451 indicates the procedures to be used to file certified copies of priority documents. Paragraph (b) includes a procedure by which the Office will automatically forward a copy of the priority document to the International Bureau if a fee for copy preparation and a request for such service is filed with the international application.

Section 1.455 relates to who may act as applicant's representative in an international application, and indicates the International Authority to which powers of attorney and revocations thereof should be sent.

Section 1.461 covers the procedures for transmittal of the record copy to the International Bureau. It should be noted that the alternative procedure in paragraph (b) requires that applicants electing transmittal of the international application by themselves rather than by the Receiving Office must file such applications before the expiration of 11 months from the priority date to permit sufficient time for the Receiving Office to process the applications before transmittal by the applicant takes place.

Section 1.465 relates to the time limits for processing based on the priority date that are set by the Treaty and its Regulations. This rule indicates which date is to be used if the original claimed priority date is either canceled or changed.

Section 1.468 refers to excusing failures to meet time limits during international processing.

Section 1.471 covers procedures for correcting or amending international applications.

Section 1.475 indicates to which International Authority changes in person, name or address of the applicant or inventor should be sent during various processing stages.

Section 1.481 relates to the International Searching Authority's finding a lack of unity of invention (multiple inventions) under PCT Rule 13 and the resulting invitation to pay additional fees. This section also relates to the filing of a protest on a holding of lack of unity of invention and the payment of additional fees.

Section 1.482 indicates that the International Searching Authority may determine the novelty and obviousness of generic or linking claims to decide if such claims properly link claims to different inventions.

PART 3

Sections 3.56 and 3.57 are proposed as oath and declaration forms which may be used when filing an international application with the United States Designated Office under 35 U.S.C. 371(c)(4).

PART 5

Section 5.1 relates to inspection of applications by defense agencies. Paragraph (a) indicates that the provisions of Part 5 apply to both national and international applications except as otherwise specifically indicated and that the filing of an international application designating a foreign country is considered to be a "foreign filing." In paragraph (b) Atomic Energy Commission is changed to the Energy Research and Development Administration.

Paragraph (d) of § 5.3 is added to indicate that the record and search copies will not be forwarded to the Authorities or delivered to the applicant if the international application is under secrecy order.

Sections 5.11, 5.14, 5.15 and 5.17 indicate that a license for filing an international application which designates a foreign country is required in the same manner as a license to file a foreign application directly in a foreign country.

The following table of contents indicates the contents of the proposed Subparts and the location of added sections and section headings.

PART 1—RULES OF PRACTICE IN PATENT CASES

SUBPART A—GENERAL PROVISIONS

(§§ 1.1–1.26)

General Information and Correspondence

* * *

§ 1.9 *Definitions.*

* * * * *

SUBPART B—NATIONAL PROCESSING PROVISIONS

(§§ 1.31–1.352)

* * * * *

The Application

* * *

§ 1.61 Filing of applications in the United States of America as a Designated Office.

Statement; Oath or Declaration

* * *

§ 1.70 Content of oath or declaration relating to content of and amendments to an application under 35 U.S.C. 371(c)(4).

* * * * *

Allowance and Issue of Patent

* * *

§ 1.318 Notification of national publication of a patent based on an international application.

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SUBPART C—INTERNATIONAL PROCESSING PROVISIONS

General Information

§ 1.401 Definitions of Terms under the Patent Cooperation Treaty.

§ 1.412 The United States Receiving Office.

§ 1.413 The International Searching Authority of Washington.

§ 1.414 The United States Designated Office.

§ 1.415 The International Bureau.

Who May File an International Application

§ 1.421 Applicant for international application.

§ 1.422 When the inventor is dead.

§ 1.423 When the inventor is insane or legally incapacitated.

§ 1.424 Joint Inventors.

§ 1.425 Filing by other than inventor.

The International Application

§ 1.431 International application requirements.

§ 1.432 Designation of States and payment of designation fees.

§ 1.433 Physical requirements of international application.

§ 1.434 The Request.

§ 1.435 The Description.

§ 1.436 The Claims.

§ 1.437 The Drawings.

§ 1.438 The Abstract.

Fees

§ 1.445 International application filing and processing fees.

§ 1.446 Refund of international application filing and processing fees.

Priority

§ 1.451 The priority claim and priority document in an international application.

Representation

§ 1.455 Representation in international applications.

Transmittal of Record Copy

§ 1.461 Procedures for transmittal of Record Copy to the International Bureau.

Timing

§ 1.465 Timing of application processing based on the priority date.

§ 1.468 Delays in meeting time limits.

Amendments

§ 1.471 Corrections and amendments during international processing.

§ 1.475 Changes in person, name, or address of applicants and inventors.

Unity of Invention

§ 1.481 Unity of invention.

§ 1.482 Holding of lack of unity of invention.

PART 3—FORMS FOR PATENT CASES

* * *

§ 3.56 Oath to be filed with United States Designated Office under 35 U.S.C. 371(c)(4).

§ 3.57 Declaration to be filed with United States Designated Office under 35 U.S.C. 371(c)(4).

The texts of the proposed amendments are as follows (additions are indicated by arrows; deletions are bracketed):

PART 1—RULES OF PRACTICE IN PATENT CASES

1. By revising §1.1 to read as follows:

§ 1.1 *All communications to be addressed to Commissioner of Patents and Trademarks.*

All letters and other communications intended for the Patent and Trademark Office must be addressed to "Commissioner of Patents and Trademarks," Washington, D.C. 20231. When appropriate, a letter [may] ►should also◄ be marked for the attention of a particular officer or individual.

►Letters and other communications relating to international applications during the international stage and prior to the assignment of a national serial number should be additionally marked "Box PCT."◄

NOTE: §§ 1.1 to 1.26 are applicable to trademark cases as well as to ►national and international◄ patent cases except for provisions specifically directed to patent[s] ►cases◄. ►See§ 1.9 for definitions of "national application" and "international application."◄

2. By revising paragraph (a) of § 1.4 to read as follows:

§ 1.4 *Nature of correspondence.*

(a) Correspondence with the Patent and Trademark Office comprises (1) correspondence relating to services and facilities of the Office, such as general inquiries, requests for publications supplied by the Office, orders for printed copies of patents or trademark registrations, orders for copies of records, transmission of assignments for recording, and the like, and (2) correspondence in and relating to a particular application or other proceeding in the Office. See particularly the rules relating to the filing ►, processing,◄ [and prosecution of applications] or other proceedings [(] ►of national applications in Subpart B,◄ §§ 1.31 to 1.352 ►; of international applications in Subpart C, §§ 1.401–1.482;◄ and ►of trademark applications,◄ §§ 2.11 to 2.189[)].

* * * * *

3. By revising paragraph (a) of § 1.5 to read as follows:

§ 1.5 *Identification of application, patent or registration.*

(a) When a letter concerns an application for patent, it should state the name of the applicant, the title of the invention, the serial number ►or international application number◄ of the application, the date of filing the same, and, if known, the group art unit and name of the examiner to which it has been assigned (see § 1.55).

* * * * *

4. By revising paragraphs (a)(1) and (xi) of § 1.8 to read as follows:

§ 1.8 *Certificate of mailing.*

(a) Except in the cases enumerated below, papers and fees required to be filed in the Patent and Trademark Office within a set period of time will be considered as being timely filed if (1) they are addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, and deposited with the United States Postal Service with sufficient postage as first class mail prior to expiration of the set period, and (2) they are accompanied by a certificate stating the date of deposit (see forms, §§ 3.55 and 4.23). The person signing the certificate should have reasonable basis to expect that the correspondence would be mailed on or before the date indicated. The actual date of receipt of the paper or fee will be used for all other purposes. This procedure does not apply to the following:

(1) The filing of ►national◄ applications ►for patent◄;

* * *

►(xi) The filing of international applications for patent and papers relating thereto.◄

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5. A new section 1.9 is added to read as follows:

►§ 1.9 *Definitions.*◄

►(a) A national application as used in this Chapter means a United States national application for patent which was either filed in the Office under 35 U.S.C. 111 or which resulted from an international application after compliance with 35 U.S.C. 371.◄

►(b) An international application as used in this Chapter means an international application for patent filed under the Patent Cooperation Treaty prior to entering national processing at the Designated Office stage.◄

6. By revising § 1.12 to read as follows:

§ 1.12 *Assignment records open to public inspection.*

The assignment records, relating to original or reissue patents, including digests and indexes, are open to public inspection and copies of any instrument recorded may be obtained upon payment of the fee therefor. Assignment records, digests and indexes, relating to any pending or abandoned application are not available to the public. Copies of any such assignment records and information with respect thereto shall be obtainable only upon written authority of the applicant or his assignee or attorney or agent or upon a showing that the person seeking such information is a bona fide prospective or actual purchaser, mortgagee or licenesee of such application, unless it shall be necessary to the proper conduct of business before the Office or as provided by these rules. An order for a copy of an assignment should give the identification of the record. If identified only by the name of the patentee and number of the patent, or in the case of a trademark registration by the name of the registrant and number of the registration, or by name of the applicant and serial number ►or international application number◄ of the application, an extra charge will be made for the time consumed in making a search for such assignment.

7. By revising paragraphs (a) and (c) of § 1.14 to read as follows:

§ 1.14 *Patent applications preserved in secrecy.*

(a) Except as provided in § 1.11(b) pending patent applications are preserved in secrecy. No information will be given by the Office respecting the filing by any particular person of an application for a patent, the pendency of any particular case before it, or the subject matter of any particular application, nor will access be given to or copies furnished of any pending application or papers relating thereto, without written authority in that particular application from the applicant or his assignee or attorney or agent of record, ►unless the application has been identified by serial number in a published patent document or the United States of America has been indicated as a designated state in a published international application, in which case status information such as whether it is pending, abandoned or patented may be supplied, or◄ unless it shall be necessary to the proper conduct of business before the Office or as provided by this part. ►Where an application has been patented, the patent number and issue date may also be supplied.◄

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(c) Applications for patents which disclose, or which appear to disclose, or which purport to disclose, inventions or discoveries relating to atomic energy are reported to the ►Energy Research and Development Administration◄ [Atomic Energy Commission] and the [Commission] ►Administration◄ will be given access to such applications, but such reporting does not constitute a determination that the subject matter of each application so reported is in fact useful or an invention or discovery or that such application in fact discloses subject matter in categories specified by secs. 151(c) and 151(d) of the Atomic Energy Act of 1954, 68 Stat. 919; 42 U.S.C. 2181.

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8. By adding a new paragraph (w) to § 1.21 to read as follows:

§ 1.21 *Patent and miscellaneous fees and charges.*

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►(w) For preparing an international-type search report in a national patent application ---------- $25.00.

NOTE: For fees relating to processing of international applications, see § 1.445.◄

9. By revising § 1.23 to read as follows:

§ 1.23 *Method of payment.*

All payments of money required for Patent and Trademark Office fees►, including fees for the processing of international applications (§ 1.445),◄ should be made in United States specie, Treasury notes, national bank notes, post office money orders, or by certified check. If sent in any other form, the Office may delay or cancel the credit until collection is made. Money orders and checks must be made payable to the Commissioner of Patents and Trademarks. Remittances from foreign countries must be payable and immediately negotiable in the United States for the full amount of the fee required. Money sent by mail to the Patent and Trademark Office will be at the risk of the sender; letters containing money should be registered.

10. By revising paragraph (b) of § 1.25 to read as follows:

§ 1.25 *Deposit accounts.*

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(b) Filing, issue, appeal, ►international-type search report, international application processing,◄ and petition fees may be charged against these accounts.

11. By revising § 1.26 to read as follows:

§ 1.26 *Refund.*

Money paid by actual mistake or in excess, such as a payment not required by law, will be refunded, but a mere change of purpose after the payment of money, as when a party desires to withdraw his application or to withdraw an appeal, will not entitle a party to demand such a return. ►Refund of a portion of any international search fee paid to the Patent and Trademark Office may be made where the prior art search made during the subsequent national examination of that application is wholly or partly based on the earlier international search made in the international application for which the search fee was paid. The amount of the refund will be as determined by the examiner according to the value of the prior international search made by the Patent and Trademark Office as an International Searching Authority, as 90%, 70%, 40%, 25% or 0% of the international search fee. If the amount of the refund is not a multiple of $10, it will be rounded off to the next higher multiple of $10. (Note § 1.446 for refund of the search fee in an international application.)◄ Amounts of ten cents or less will not be returned unless specifically demanded, within a reasonable time, nor will the payer be notified of such amount; amounts over ten cents but less than one dollar may be returned in postage stamps, and other amounts by check.

12. By revising paragraphs (a) and (b) of § 1.52 to read as follows:

§ 1.52 *Language, paper, writing, margins.*

(a) The ►application, any papers pertaining thereto, any amendments and the◄ [specification and] oath or declaration must be in the English language ►or be accompanied by a verified translation of the application and a translation of any other papers into the English language◄. All papers which are to become a part of the permanent records of the Patent and Trademark Office must be legibly written ►, typed,◄ or printed in permanent ink or its equivalent in quality. All of the application papers must be presented in a form having sufficient clarity and contrast between the paper and the writing►, typing,◄ or printing thereon to permit the ►direct◄ production of readily legible copies in any number by use of photographic, electrostatic, photooffset, and microfilming processes. If the papers are not of the required quality, substitute typewritten or printed papers of suitable quality may be required.

(b) The application papers (specification, including claims, ►abstract,◄ oath[,] or declaration, ►and◄ papers as provided for in §§ 1.42, 1.43, 1.47, etc.) and also papers subsequently filed, must be plainly written on but one side of the paper. The size of all sheets of paper should be 8 to 8½ by 10½ to 13 inches (20.3 to 21.6 cm. by 26.6 to 33.0 cm.). A margin of ►at least approximately one inch (2.5 cm.)◄ [1½ inches (3.8 cm.)] must be reserved on the left-hand side ►of each page. The◄ [and on the] top of each page of the ►application◄ [specification], including claims ►must have a margin of at least approximately ¾ inch (2 cm.)◄. The lines ►of text◄ must not be crowded too closely together; typewritten lines should be ►1½ or◄ double spaced. The pages of the ►application◄ [specification], including claims ►and abstract◄, should be numbered consecutively, starting with 1, the numbers being ►centrally located above or preferably, below, the text◄ [placed in the center of the bottom margins].

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13. By adding paragraph (d) to § 1.55 to read as follows:

§ 1.55 *Serial number and filing date of application.*

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►(d) The filing date of an international application designating the United States of America shall be treated as the filing date in the United States of America under PCT Article 11(3), except provided in 35 U.S.C. 102(e).◄

14. By revising § 1.57 to read as follows:

§ 1.57 *Signature.*

►(a)◄ The application must be signed by the applicant in person. The signature to the oath or declaration ►under § 1.65◄ will be accepted as the signature to the application provided the oath or declaration ►under § 1.65◄ is attached to and refers to the specification and claims to which it applies. Otherwise the signature must appear at the end of the specification after the claims.

►(b) The signature to the oath or declaration under § 1.70 will be accepted as the signature to the application provided the oath or declaration under § 1.70 specifically refers to the specification and claims to which it applies.◄

►(c)◄ Full names must be given, including at least one given name without abbreviation together with any other given name or initial.

15. By revising § 1.58 to read as follows:

§ 1.58 *Chemical and mathematical formulas and tables.*

(a) The specification, including the claims, may contain chemical and mathematical formulas, but shall not contain drawings or flow diagrams. The description portion of the specification may contain tables; claims may contain tables ►either◄ [only] if necessary to conform to 35 U.S.C. 112 ►or if otherwise found to be desirable◄.

(b) All tables and chemical and mathematical formulas in the specification, including claims, and amendments thereto, must be on ►paper which is flexible, strong, white, smooth, non-shiny and durable◄ [pure white durable paper, the surface of which is calendered and smooth], in order to permit use as camera copy when printing any patent which may issue. A good grade of bond paper is acceptable; watermarks should not be prominent. India ink or its equivalent, or solid black typewriter ribbon ►should◄ [must] be used to secure perfectly ►dark◄ [black] solid lines.

(c) To facilitate camera copying when printing, the width of formulas and tables as presented should be limited normally to 5 inches (12.7 cm.) so that it may appear as a single column in the printed patent. If it is not possible to limit the width of a formula or table to 5 inches (12.7 cm.), it is permissible to present the formula or table with a maximum width of 10¾ inches (27.3 cm.) and to place it sideways on the sheet [, in which case the formula or table will appear printed across both columns of the page in the printed patent]. Typewritten characters used in such formulas and tables must be from a block (nonscript) type font or lettering style having capital letters which are at least ►0.08◄ [0.085] inch ►(2.1 mm.)◄ [(2.2 mm.)] high (e.g. elite type). Hand lettering must be neat, clean, and have a minimum character height of ►0.08◄ [0.085] inch ►(2.1 mm.)◄ [(2.2 mm.)]. A space at least ¼ inch (6.4 mm.) high should be provided between the formulas and tables and the text. Tables should have the lines and columns of data closely spaced to conserve space, consistent with high degree of legibility.

16. By adding a new § 1.61 to read as follows:

►§ 1.61 *Filing of application in the United States of America as a Designated Office.*◄

►(a) To maintain the benefit of the international filing date, the applicant shall furnish to the United States Patent and Trademark Office a copy of the international application with any amendments, unless it has been previously furnished by the International Bureau or unless it was originally filed in the United States Patent and Trademark Office, a verified translation of the international application and a translation of any amendments into the English language if originally filed elsewhere in another language, the national fee (see § 1.445(a)(4)) and an oath or declaration of the inventor (see § 1.70) not later than the expiration of 20 months from the priority date.◄

►(b) Where an International Searching Authority has made a declaration that no international search report will be established because the international application relates to subject matter which it is not required to search, or because the application fails to comply with the prescribed requirements to such an extent that a meaningful search could not be carried out, the time for performing the acts referred to in

paragraph (a) of this section is two months from the mailing date of the declaration to the applicant.◄

17. By adding a new § 1.70 to read as follows:

►§ 1.70 *Content of oath or declaration relating to content of and amendments to an application under 35 U.S.C. 371(c)(4).*◄

►(a)(1) When an applicant of an international application, if the inventor, desires to enter the national stage under 35 U.S.C. 371, he must specifically identify the international application and any amendments thereto and state that he verily believes himself to be the original and first inventor or discoverer of the process, machine, manufacture, composition of matter, or improvement thereof, for which he solicits a patent; that he does not know and does not believe that the same was ever known or used in the United States of America before his invention or discovery thereof, and shall state of what country he is a citizen and where he resides and whether he is a sole or joint inventor of the invention claimed in his international application as filed or as amended. In every application the applicant must distinctly state that to the best of his knowledge and belief the invention has not been in public use or on sale in the United States of America more than one year prior to his international application, or patented or described in any printed publication in any country before his invention or more than one year prior to his international application, or patented or made the subject of an inventor's certificate in any foreign country prior to the date of his international application on an application filed by himself or his legal representatives or assigns more than twelve months prior to his international application. He shall state whether or not any application for patent or inventor's certificate on the same invention has been filed in any foreign country, either by himself, or by his legal representatives or assigns. If any such application has been filed, the applicant shall name the country in which the earliest such application was filed, and shall give the day, month, and year of its filing; he shall also identify by country and by day, month, and year of filing, every such foreign application filed more than twelve months before the filing of the international application.◄

►(2) This statement (i) must be subscribed to by the applicant, and (ii) must either (a) be sworn to (or affirmed) as provided in § 1.66, or (b) include the personal declaration of the applicant as prescribed in § 1.68.◄

►(b) If the international application was made as provided in §§ 1.422, 1.423 or 1.425, the applicant shall state his relationship to the inventor and, upon information and belief, the facts which the inventor is required by this section to state.◄

18. By revising paragraph (b) of § 1.72 to read as follows:

§ 1.72 *Title and abstract.*

* * * * *

(b) A brief abstract of the technical disclosure in the specification must be set forth ►on a separate sheet, preferably following the claims◄ [immediately following the title and preceding the disclosure in a separate paragraph] under the heading "Abstract of the Disclosure." The purpose of the abstract is to enable the Patent and Trademark Office and the public generally to determine quickly from a cursory inspection the nature and gist of the technical disclosure, and the abstract shall not be used for interpreting the scope of the claims.

19. By revising paragraph (c) of § 1.75 and adding paragraphs (f) and (g) as follows:

§ 1.75 *Claim(s).*

* * * * *

(c) ►One or more claims may be presented in dependent form, referring back to another claim or claims in the same application. Any dependent claim which refers to more than one other claim ("multiple dependent claim") shall refer to such other claims in the alternative only. A multiple dependent claim shall not serve as a basis for any other multiple dependent claim.◄ [When more than one claim is presented, they may be placed in dependent form in which a claim may refer back to and further restrict a single preceding claim]. Claims in dependent form shall be construed to include all the limitations of the claim incorporated by reference into the dependent claim. ►A multiple dependent claim shall be construed to incorporate by reference all the limitations of the particular claim in relation to which it is being considered.◄

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►(f) If there are several claims, they shall be numbered consecutively in Arabic numerals.◄

►(g) All dependent claims referring back to a single previous claim, and all dependent claims referring back to several previous claims, should be grouped together to the extent possible.◄

20. By revising § 1.77 to read as follows:

§ 1.77 *Arrangement of application ►elements◄.*

The ►elements of the application should appear in the following order◄ [following order of arrangement should be observed in framing the application]:

(a) Title of the invention; or an introductory portion stating the name, citizenship, and residence of the applicant, and the title of the invention may be used.

(b) [Abstract of the disclosure.] ►(reserved)◄

(c) Cross-references to related application, if any.

(d) Brief summary of the invention.

(e) Brief description of the several views of the drawing, if there are drawings.

(f) Detailed description.

(g) Claim or claims.

(h) Signature. (See § 1.57.)

►(i) Abstract of the disclosure.◄

►(j) Drawings.◄

21. By revising paragraph (a) of § 1.78 to read as follows:

§ 1.78 *Cross-references to other applications.*

(a) When an applicant files an application claiming an invention disclosed in a prior filed copending ►national◄ application ►or international application designating the United States of America◄ of the same applicant, the second application must contain or be amended to contain in the first sentence of the specification following the title [and abstract] a reference to [the] ►such◄ prior application, identifying it by serial number and filing date ►or international application number and international filing date◄ and indicating the relationship of the applications, if the benefit of the filing date of [the] ►such◄ prior application is to be claimed. Cross-references to other related applications may be made when appropriate. (See §1.14(b).)

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22. By revising §1.81 to read as follows:

§ 1.81 *Drawings required.*

►(a)◄ The applicant for patent is required by statute to furnish a drawing of his invention ►where necessary for the understanding of the subject matter sought to be patented;◄ [whenever the nature of the case admits of it;] this drawing must be filed with the application.

►(b)◄ Illustrations facilitating an understanding of the invention (for example, flow sheets in cases of processes, and diagrammatic views) may also be furnished in the same manner as drawings [and may be required by the Office when considered necessary or desirable].

►(c) When a drawing or illustration is not necessary for, but would facilitate, the understanding of the subject matter sought to be patented and the applicant has not furnished such a drawing or illustration, the Office may require its submission within a time period of not less than two months from the sending of a notice thereof.◄

23. By revising § 1.83 to read as follows:

§ 1.83 *Content of drawing.*

(a) The drawing ►should preferably◄ [must] show every feature of the invention specified in the claims. [However,] Conventional features disclosed in the description and claims, where their detailed illustration is not essential for a proper understanding of the invention, should be illustrated in the drawing in the form of a graphical drawing symbol or a labeled representation (e.g., a labeled rectangular box).

(b) When the invention consists of an improvement on an old machine the drawing ►should◄ [must] when possible exhibit, in one or more views, the improved portion itself, disconnected from the old structure, and also in another view, so much only of the old structure as will suffice to show the connection of the invention therewith.

24. By revising paragraphs (a), (b), (c), (d), (e), (f), (i), (j) and (l) of § 1.84 to read as follows:

§ 1.84 *Standards for drawings.*

(a) *Paper and ink.* Drawings must be made upon ►paper which is flexible, strong, white, smooth, non-shiny and durable.◄ [pure white paper of a thickness corresponding to] Two-ply or three-ply bristol-board ►is preferred◄. The surface of the paper ►should◄ [must] be calendered [and smooth] and of a quality which will permit erasure and correction with India ink. India ink, or its equivalent in quality, ►is preferred◄ [must be used] for pen drawings to secure perfectly black solid lines. The use of white pigment to cover lines is not ►normally◄ acceptable.

(b) *Size of sheet and margins.* The size of ►the sheets on which drawings are made may either be◄ [a sheet on which a drawing is made must be] exactly 8½ by 14 inches (21.6 by 35.6 cm.) ►or exactly 21.0 by 29.7 cm. (DIN size A4). All drawing sheets in a particular application must be the same size.◄ One of the shorter sides of the sheet is regarded as its top.

►(1) On 8½ by 14 inch drawing sheets,◄ the drawing must include a top margin of 2 inches (5.1 cm.) and bottom and side margins of one-quarter inch (6.4 mm.) from the edges, thereby leaving a "sight" precisely 8 by 11¾ inches (20.3 by 29.8 cm.). Margin border lines are not permitted. All work must be included within the "sight." The sheets may be provided with two one-quarter inch (6.4 mm.) diameter holes having their centerlines spaced eleven-sixteenths inch (17.5 mm.) below the top edge and 2¾ inches (7.0 cm.) apart, said holes being equally spaced from the respective side edges.

►(2) On 21.0 by 29.7 cm. drawing sheets, the drawing must include a top margin of at least 2.5 cm., a left side margin of 2.5 cm., a right side margin of 1.5 cm., and a bottom margin of 1.0 cm. Margin border lines are not permitted. All work must be contained within a sight size not to exceed 17 by 26.2 cm.◄

(c) *Character of lines.* All drawings must be made with drafting instruments or by a process which will give them satisfactory reproduction characteristics. Every line and letter must be ►durable, black or blue, sufficiently dense and dark, uniformly thick and well defined;◄ [absolutely black and permanent;] the weight of all lines and letters must be heavy enough to permit adequate reproduction. This direction applies to all lines however fine, to shading, and to lines representing cut surfaces in sections views. All lines must be clean, sharp, and solid [, and fine] ►. Fine◄ or crowded lines should be avoided. Solid black ►or blue◄ should not be used for sectional or surface shading. Freehand work should be avoided wherever it is possible to do so.

(d) *Hatching and shading.* (1) Hatching should be made by oblique parallel lines ►spaced sufficiently apart to enable the lines to be distinguished without difficulty◄ [, which may be not less than about one-twentieth inch (1.3 mm.) apart].

(2) Heavy lines on the shade side of objects should ►preferably◄ be used except where they tend to thicken the work and obscure reference characters. The light should come from the upper left hand corner at an angle of 45°. Surface delineations should ►preferably◄ be shown by proper shading, which should be open.

(e) *Scale.* The scale to which a drawing is made ought to be large enough to show the mechanism without crowding when the drawing is reduced ►in size to two-thirds◄ in reproduction, and views of portions of the mechanism on a larger scale should be used when necessary to show details clearly; two or more sheets should be used if one does not give sufficient room to accomplish this end, but the number of sheets should not be more than is necessary.

(f) *Reference characters.* The different views should be consecutively numbered figures. Reference numerals (and letters, but numerals are preferred) must be plain, legible and carefully formed, and not be encircled. They should, if possible, measure at least one-eighth of an inch (3.2 mm.) in height so that they may bear reduction to one twenty-fourth of an inch (1.1 mm.); and they may be slightly larger when there is sufficient room. They ►should◄ [must] not be so placed in the close and complex parts of the drawing as to interfere with a thorough comprehension of the same, and therefore should rarely cross or mingle with the lines. When necessarily grouped around a certain part, they should be placed at a little distance, at the closest point where there is available space, and connected by lines which the parts to which they refer. They should not be placed upon hatched or shaded surfaces but when necessary, a blank space may be left in the hatching or shading where the character occurs so that it shall appear perfectly distinct and separate from the work. The same part of an invention appearing in more than one view of the drawing must always be designated by the same character, and the same character must never be used to designate different parts. ►Reference signs not mentioned in the description shall not appear in the drawing, and vice versa.◄

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(i) *Views.* The drawing must contain as many figures as may be necessary to show the invention; the figures should be consecutively numbered if possible in the order in which they appear. The figures may be plain, elevation, section, or perspective views, and detail views of portions or elements, on a larger scale if necessary, may also be used. Exploded views, with the separated parts of the same figure embraced by a bracket, to show the relationship or order of assembly of various parts are permissible. When necessary, a view of a large machine or device in its entirety may be broken and extended over several sheets if there is no loss in facility of understanding the view. ►Where figures on two or more sheets form in effect a single complete figure, the figures on the several sheets should be so arranged that the complete figure can be assembled without concealing any part of any of the figures appearing in the various sheets◄ [(the different parts should be identified by the same figure number but followed by the letters, a, b, c, etc., for each part)]. The plane upon which a sectional view is taken should be indicated on the general view by a broken line, the ends of which should be designated by numerals corresponding to the figure number of the sectional view and have arrows applied to indicate the direction in which the view is taken. A moved position may be shown by a broken line superimposed upon a suitable figure if this can be done without crowding, otherwise a separate figure must be used for this purpose. Modified forms of construction can only be shown in separate figures. Views should not be connected by projection lines nor should center lines be used.

(j) *Arrangement of views.* All views on the same sheet ►should◄ [must] stand in the same direction and [should], if possible, stand so that they can be read with the sheet held in an upright position. If views longer than the width of the sheet are necessary for the clearest illustration of the invention, the sheet may be turned on its side so that the ►top of the sheet with the appropriate top margin◄ [two-inch (5.1 cm.) margin] is on the right hand side. One figure must not be placed upon another or within the outline of another.

* * * * *

(l) *Extraneous matter.* [An inventor's, agent's, or attorney's name, signature, stamp, or address, or other extraneous matter, will not be permitted upon the face of a drawing, within or without the margin, except that] Indentifying indicia (►such as the◄ attorney's docket number, inventor's name, number of sheets, etc.) [should] ►not to exceed 2¾ inches (7.0 cm.) in width may◄ be placed ►in a centered location between the side edges◄ within three-fourths inch (19.1 mm.) of the top edge [and between the hole locations defined in paragraph (b) of this section]. Authorized security markings may be placed on the drawings provided they [be] ►are◄ outside the illustrations and are removed when the material is declassified. ►Other extraneous matter will not be permitted upon the face of a drawing.◄

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25. By adding new paragraphs (c) and (d) to § 1.104 to read as follows:

§ 1.104 *Nature of examination; examiner's action.*

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►(c) An international-type search will be made in all national applications filed on and after the date the United States Patent and Trademark Office is appointed as an International Searching Authority.◄

►(d) Any national application may also have an international-type search report prepared thereon at the time of

the national examination upon specific written request therefor and payment of the international-type search report fee. See § 1.21(w) for amount of fee for preparation of international-type search report.◄

26. By revising § 1.141 to read as follows:

§ 1.141 *Different inventions in one application.*

►(a)◄ Two or more independent and distinct inventions may not be claimed in one application ►. However, a group of inventions which are so linked as to form a single general inventive concept such as those set forth in paragraphs (b), (c) or (d) of this section, are considered to be one invention under §§ 1.141–1.146◄ [except that more than one species of an invention, not to exceed five].

►(b) Different species of an invention◄ may be specifically claimed in different claims in one application, provided the application also includes an allowable claim generic to all the claimed species and all the claims to [each] species in excess of one are written in dependent form (§ 1.75) or otherwise include all the limitations of the generic claim.

►(c) Paragraph (a) of this section shall be construed as permitting the examination of claims of different categories in an application, in particular either of the following two groupings of claims of different categories:◄

►(1) in addition to an independent claim for a given product, the inclusion in the same application of one independent claim for one process specially adapted for the manufacture of the said product, or the inclusion in the same application of one independent claim for one use of the said product, or both; or◄

►(ii) in addition to an independent claim for a given process, the inclusion in the same application of one independent claim for one apparatus or means specifically designed for carrying out the said process.◄

►(d) If the product claim of subparagraph (i) of paragraph (c) of this section or the process claim of subparagraph (ii) of paragraph (c) of this section is not allowable, the examiner may withdraw from consideration the claims to the other categories. If subsequently such a product or process claim is found allowable, the examiner must also consider the merits of the claims to the other categories as indicated in subparagraphs (i) and (ii) of paragraph (c) of this section.◄

►(e) Subject to paragraph (a) of this section, and except where paragraph (c) of this section applies, there may be included in the same application two or more independent claims of one and the same category (i.e., product, process, apparatus, or use) which cannot readily be covered by a single generic claim.◄

27. By revising § 1.146 to read as follows:

§ 1.146 *Election of species.*

In the first action on an application containing a generic claim and claims restricted separately to each of more than one species embraced thereby, the examiner[, if of the opinion after a complete search on the generic claims that no generic claim presented is allowable,] shall require the applicant in his response to that action to elect that species of his invention to which his claims shall be restricted if no generic claim is finally held allowable. [However, if such application contains claims directed to more than five species, the examiner may require restriction of the claims to not more than five species before taking any further action in the case.]

28. By adding a new § 1.318 to read as follows:

►§ 1.318 *Notification of national publication of a patent based on an international application.*◄

►The Office will notify the International Bureau when a patent is issued on an application filed under 35 U.S.C. 371, and there has been no previous international publication.◄

29. By revising paragraphs (a) and (c) of § 1.331 to read as follows:

§ 1.331 *Recording of assignments.*

(a) Assignments, including grants and conveyances, of patents ►, national applications, or international applications which designate the United States of America◄ [or applications for patents] under 35 U.S.C. 261, will be recorded in the Patent and Trademark Office. Other instruments affecting title to a patent [or application for patent,] ►, a national application, or an international application which designates the United States of America◄, and licenses, even though the recording thereof may not serve as constructive notice under 35 U.S.C. 261, will be recorded as provided in this section or in the discretion of the Commissioner.

* * * * *

(c) An instrument relating to a patent should identify the patent by number and date (the name of the inventor and title of the invention as stated in the patent should also be given); an instrument relating to [an] ►a national application, or an international◄ application ►which designates the United States of America◄ should identify the application by serial ►number or international application◄ number and date of filing (the name of the inventor and title of the invention as stated in the application should also be given) but if an assignment is executed concurrently with or subsequent to the execution of the application but before the application is filed or before its serial ►number or international application◄ number and filing date are ascertained, it should adequately identify the application, as by its date of execution and name of the inventor and title of the invention; so that there can be no mistake as to the patent or application intended.

Proposed Subpart C

30. By adding a new § 1.401 to read as follows:

►§ 1.401 *Definitions of Terms under the Patent Cooperation Treaty.*◄

►(a) The abbreviation "PCT" or the term "Treaty" means the Patent Cooperation Treaty.◄

►(b) "International Bureau" means the World Intellectual Property Organization located at 32 chemin des Colombettes, Geneva, Switzerland.◄

►(c) "Administrative Instructions" means that body of instructions for operating under the Patent Cooperation Treaty referred to in PCT Rule 89.◄

►(d) "Request," when capitalized, means that element of the international application described in PCT Rules 3 and 4.◄

►(e) "International application," as used in this Subchapter is defined in § 1.9.◄

►(f) "Priority date" for the purposes of computing time limits under the Patent Cooperation Treaty is defined in PCT Art. 2 (xi). Note also § 1.465.◄

►(g) Other terms and expressions in this subpart C not defined in this section are to be taken in the sense indicated in PCT Art. 2 and 35 U.S.C. 351.◄

31. By adding a new § 1.412 to reads as follows:

◄§ 1.412 *The United States Receiving Office.*◄

►(a) The United States Patent and Trademark Office is a Receiving Office only for applicants who are residents or nationals of the United States of America.◄

►(b) The Patent and Trademark Office, when acting as a Receiving Office, will be identified by the full title "United States Receiving Office" or by the abbreviation "RO/US."◄

►(c) The major functions of the Receiving Office include:

(1) according of international filing dates to international applications meeting the requirements of PCT Art. 11(1), and PCT Rule 20;

(2) assuring that international applications meet the standards for format and content of PCT Art. 14(1), PCT Rules 9, 26, 29.1, 37, 38, 91, and portions of PCT Rules 3 through 11;

(3) collecting and, when required, transmitting fees due for processing international applications (PCT Rules 14, 15, 16); and

(4) transmitting the record and search copies to the International Bureau and International Searching Authority, respectively (PCT Rules 22 and 23).◄

32. By adding a new § 1.413 to read as follows:

►§ 1.413 *The International Searching Authority of Washington.*◄

►(a) Pursuant to appointment by the Assembly, the United States Patent and Trademark Office will act as an International Searching Authority for international applica-

tions filed with the United States Receiving Office, in accordance with agreement between the Patent and Trademark Office and the International Bureau (PCT Art. 16(3)(b)).◄

►(b) The Patent and Trademark Office, when acting as an International Searching Authority, will be identified by the full title "International Searching Authority of Washington," or by the abbreviation "ISA/US."◄

►(c) The major functions of the International Searching Authority include:

(1) approving or establishing the title and abstract;

(2) considering the matter of unity of invention;

(3) conducting international and international-type searches and preparing international and international-type search reports (PCT Art. 15, 17 and 18, and PCT Rules 25, 33–45 and 47); and

(4) transmitting the international search report to the applicant and the International Bureau.◄

33. By adding a new § 1.414 to read as follows:

►§ 1.414 *The United States Designated Office.*◄

►(a) The United States Patent and Trademark Office will act as a Designated Office for international applications in which the United States of America has been designated as a State in which patent protection is desired.◄

►(b) The Patent and Trademark Office, when acting as a Designated Office during international processing will be identified by the full title "United States Designated Office" or by the abbreviation "DO/US."◄

►(c) The major functions of the United States Designated Office in respect to international applications in which the United States of America has been designated, include:

(1) receiving various notifications throughout the international stage,

(2) accepting for regular national patentability examination international applications which satisfy the requirements of 35 U.S.C. 371, and

(3) conducting reviews under PCT Article 25 for those international applications declared withdrawn.◄

34. By adding a new § 1.415 to read as follows:

►§ 1.415 *The International Bureau.*◄

►(a) The International Bureau is the World Intellectual Property Organization located at Geneva, Switzerland. It is the international intergovernmental organization which acts as the coordinating body under the Treaty and the Regulations. (PCT Art. 2 (xix) and 35 U.S.C. 351(h).)◄

►(b) The major functions of the International Bureau include:

(1) publishing of international applications and the International Gazette;

(2) transmitting copies of international applications to Designated Offices;

(3) storing and maintaining record copies; and transmitting information to authorities pertinent to the processing of specific international applications.◄

35. By adding a new § 1.421 to read as follows:

►§ 1.421 *Applicant for international application.*◄

►(a) Only residents or nationals of the United States of America may file international applications in the United States Receiving Office.◄

►(b) Although the United States Receiving Office will accept international applications filed by any resident or national of the United States of America for international processing, an international application designating the United States of America will be accepted by the Patent and Trademark Office for the national stage only if filed by the inventor or as provided in §§ 1.422, 1.423 or 1.425.◄

►(c) International applications which do not designate the United States of America may be filed by the assignee or owner.◄

►(d) Any indication of different applicants for the purpose of different designated offices must be shown on the Request portion of the international application.◄

►(e) Changes in the person, name, or address of the applicant shall be made in accordance with PCT Rule 18.5.◄

36. By adding a new § 1.422 to read as follows:

►§ 1.422 *When the inventor is dead.*◄

►In case of the death of the inventor, the legal representative (executor, administrator, etc.) of the deceased inventor may sign the Request and other papers in an international application which designates the United States of America.◄

37. By adding a new § 1.423 to read as follows.

►§ 1.423 *When the inventor is insane or legally incapacitated.*◄

►In case an inventor is insane or otherwise legally incapacitated, the legal representative (guardian, conservator, etc.) of such inventor may sign the Request and other papers in an international application which designates the United States of America.◄

38. By adding a new § 1.424 to read as follows:

►§ 1.424 *Joint inventors.*◄

►Joint inventors must each sign the Request in an international application which designates the United States of America; the signature of either of them alone, or less than the entire number will be insufficient for an invention invented by them jointly, except as provided in § 1.425.◄

39. By adding a new § 1.425 to read as follows:

►§ 1.425 *Filing by other than inventor.*◄

►(a) If a joint inventor refuses to join in an international application which designates the United States of America or cannot be found or reached after diligent effort, the international application which designates the United States of America may be filed by the other inventor on behalf of himself and the omitted inventor. Such an international application which designates the United States of America must be accompanied by proof of the pertinent facts and must state the last known address of the omitted inventor. The Patent and Trademark Office shall forward notice of the filing of the international application to the omitted inventor at said address.◄

►(b) Whenever an inventor refuses to execute an international application which designates the United States of America, or cannot be found or reached after diligent effort, a person to whom the inventor has assigned or agreed in writing to assign the invention or who otherwise shows sufficient proprietary interest in the matter justifying such action may file the international application on behalf of and as agent for the inventor. Such an international application which designates the United States of America, must be accompanied by proof of the pertinent facts and a showing that such action is necessary to preserve the rights of the parties or to prevent irreparable damage, and must state the last known address of the inventor. The assignment, written agreement to assign or other evidence of proprietary interest, or a verified copy thereof, must be filed in the Patent and Trademark Office. The Office shall forward notice of the filing of the application to the inventor at the address stated in the application.◄

40. By adding a new § 1.431 to read as follows:

►§ 1.431 *International application requirements.*◄

►(a) An international application shall contain, as specified in the Treaty and the Regulations, a Request, a description, one or more claims, one or more drawings (where required), and an abstract (PCT Art. 3(2)).◄

►(b) An international filing date will be accorded by the United States Receiving Office, at the time of receipt of the international application, provided that:

(1) The applicant is a United States resident or national (35 U.S.C. 361(a), PCT Art. 11(1)(i)).

(2) The international application is in the English language (35 U.S.C. 361(c), PCT Art. 11(1)(ii)).

(3) The international application contains at least the following elements (PCT Art. 11(1)(iii)):

(i) an indication that it is intended as an international application (PCT Rule 4.2),

(ii) the designation of at least one contracting State of the International Patent Cooperation Union,

(iii) the name of the applicant, as prescribed (note § 1.422),

(iv) a part which on the face of it appears to be a description, and

(v) a part which on the face of it appears to be a claim (PCT Art. 11(1)).◄

►(c) Payment of the basic portion of the international fee (PCT Rule 15.2) and the transmittal and search fee (§ 1.441)

shall be made in full at the time the international application papers required by paragraph (b) of this section are deposited. Failure to make full payment on the same date as the deposit of the international application papers required by subparagraph (b) of this section will result in the international application being considered withdrawn (PCT Art. 14(3)(a)).◄

41. By adding a new § 1.432 to read as follows:

►§ 1.432 *Designation of States and payment of designation fees.*◄

►(a) The names of Designated States shall appear in the Request upon filing and must be indicated as set forth in Section 202 of the Administrative Instructions.◄

►(b) The designation fees may be paid upon filing of the international application, but must be paid at the latest before the expiration of one year from the priority date (PCT Rule 15.4(b)). Failure to timely pay the designation fee for a particular Designated State will result in the withdrawal of that designation (PCT Art. 14(3)(b)). Failure to timely pay at least one designation fee will result in the withdrawal of the international application (PCT Art. 14(3)(a)).◄

42. By adding a new § 1.433 to read as follows:

►§ 1.433 *Physical requirements of international application.*◄

►(a) The international application and each of the documents that may be referred to in the check list of the Request (PCT Rule 3.3(a)(ii)) shall be filed in one copy only.◄

►(b) The physical requirements for international applications are set forth in PCT Rule 11 and Sections 201–208 of the Administrative Instructions.◄

43. By adding a new § 1.434 to read as follows:

►§ 1.434 *The Request.*◄

►(a) The Request shall be made on a standardized printed form (PCT Rules 3 and 4). Copies of such printed Request forms are available from the Patent and Trademark Office.◄ Letters requesting such forms should be marked "Box PCT."

►(b) The Check List portion of the Request form should indicate each document accompanying the international application on filing.◄

►(c) All information, for example, addresses, names of States and dates, shall be indicated in the Request as required by PCT Rule 4 and Administrative Instructions 201 and 202.◄

►(d) International applications which designate the United States of America shall include:

(1) the name, address, and signature of the inventor, except as provided by §§ 1.422, 1.423 and 1.425;

(2) a reference to any copending national application or international application designating the United States of America, if the benefit of the filing date of the prior copending application is to be claimed.◄

44 By adding a new § 1.435 to read as follows:

►§ 1.435. *The Description.*◄

►(a) Requirements as to the content and form of the description are set forth in PCT Rules 5, 9, 10, and 11 and Administrative Instruction 205, and shall be adhered to.◄

►(b) In International applications designating the United States of America the description must contain upon filing an indication of the best mode contemplated by the inventor for carrying out the claimed invention.◄

45. By adding a new § 1.436 to read as follows:

►§ 1.436 *The Claims.*◄

►The requirements as to the content and format of claims are set forth in PCT Art. 6 and PCT Rules 6, 9, 10, and 11 and shall be adhered to.◄

46. By adding a new § 1.437 to read as follows:

►§ 1.437 *The Drawings.*◄

►(a) Subject to paragraph (b) of this section, when drawings are necessary for the understanding of the invention, or are mentioned in the description, they must be part of an international application as originally filed in the United States Receiving Office in order to maintain the international filing date during the national stage (PCT Art. 7).◄

►(b) Drawings missing from the application upon filing will be accepted if such drawings are received within 30 days of the date of first receipt of the incomplete papers. If the missing drawings are received within the 30 day period, the international filing date shall be the date on which such drawings are received. If such drawings are not timely received all references to drawings in the international application shall be considered non-existent (PCT Art. 14(2), Administrative Instruction 310).◄

►(c) The physical requirements for drawings are set forth in PCT Rule 11 and shall be adhered to.◄

47. By adding a new § 1.438 to read as follows:

►§ 1.438 *The Abstract.*◄

►(a) Requirements as to the content and form of the abstract are set forth in PCT Rule 8, and shall be adhered to.◄

►(b) Lack of an abstract upon filing of an international application will not affect the granting of a filing date. However, failure to furnish an abstract within one month from the date of the notification by the Receiving Office will result in the international application being declared withdrawn.◄

48. By adding a new § 1.445 to read as follows:

►§ 1.445 *International application filing and processing fees.*◄

►(a) The following fees and charges are established by the Patent and Trademark Office under the authority of 35 U.S.C. 376:

(1) A transmittal fee (see 35 U.S.C. 361(d) and PCT Rule 14)—$35.00.

(2) A search fee (see 35 U.S.C. 361(d) and PCT Rule 16)—$300.00.

(3) A supplemental search fee when required (see PCT Art. 17(3)(a) and PCT Rule 40.2)—$200.00 per additional invention.

(4) The national fee, that is, the amount set forth as the filing fee under 35 U.S.C. 41(a)1.

(5) A special fee when required, see 35 U.S.C. 372(c)—$10.00 per claim.◄

►(b) The basic fee and designation fee portions of the international fee shall be as prescribed in PCT Rule 15.◄

49. By adding a new § 1.446 to read as follows:

►§ 1.446 *Refund of international application filing and processing fees.*◄

►(a) Money paid for international application fees, where paid by actual mistake or in excess, such as a payment not required by law or Treaty and its Regulations, will be refunded.◄

►(b) Refunds of a portion of the search fee may be made if the international search report is wholly or partly based on an earlier international or international-type search. (PCT Rules 16 and 41.) The amount of the refund will be as determined by the examiner according to the value of the prior international-type search or international search as 90%, 70%, 40%, 25% or 0% of the international search fee. See § 1.26 for refund of a portion of the international search fee during subsequent national examination of the application.◄

►(c) Refund of the supplemental search fees will be made if such refund is determined to be warranted by the Commissioner or his designee acting under PCT Rule 40.2(c).◄

►(d) The international and search fees will be refunded if no international filing date is granted (PCT Rules 15.6 and 16.2).◄

50. By adding a new § 1.451 to read as follows:

►§ 1.451 *The priority claim and priority document in an international application.*◄

►(a) The claim for priority must be made on the Request (PCT Rule 4.10) in a manner complying with Section 201 and 202 of the Administrative Instructions.◄

►(b) Whenever the priority of an earlier United States national application is claimed in an international application, the applicant may request in a letter of transmittal accompanying the international application upon filing with the United States Receiving Office, that the Patent and Trademark Office prepare a certified copy of the national applica-

tion for transmittal with the record copy to the International Bureau (PCT Art. 8 and PCT Rule 17). The fee for preparing a certified copy is stated in § 1.21(b) and (d).◄

►(c) If a certified copy of the priority document is not submitted together with the international application on filing or a request and appropriate payment as in paragraph (b) of this section do not accompany the international application on filing, the certified copy of the priority document must be transmitted directly by the applicant to the International Bureau within the time limit specified in PCT Rule 17.1(a).◄

51. By adding a new § 1.455 to read as follows:

►§ 1.455 *Representation in international applications.*◄

►(a) Applicants of international applications may be represented by attorneys or agents licensed to practice before the Patent and Trademark Office or by a common representative (PCT Art. 49, Rules 4.8 and 90 and § 1.341).◄

►(b) Appointment of an agent, attorney or common representative must be effected either in the Request form, signed by all applicants, or in a separate power of attorney submitted either to the United States Receiving Office or to the International Bureau.◄

►(c) Powers of attorney and revocations thereof should be submitted to the United States Receiving Office until the issuance of the international search report in order to facilitate communications.◄

►(d) The addressee for correspondence will be as indicated in Section 108 of the Administrative Instructions.◄

52. By adding a new § 1.461 to read as follows:

►§ 1.461 *Procedures for transmittal of Record Copy to the national Bureau.*◄

►(a) Transmittal of the record copy of the international application to the International Bureau shall be made, at the option of the applicant, either by the United States Receiving Office or by the applicant. Subject to paragraph (b) of this section, any applicant who chooses to make such transmittal himself shall notify the United States Receiving Office to that effect in writing, by way of a notice filed together with the international application. Such notice shall also state whether the applicant wishes to collect the record copy at the United States Receiving Office or to have the record copy mailed directly to him. The record copy of an international application which was filed without being accompanied by such notice will be transmitted to the International Bureau by the United States Receiving Office. (PCT Rule 22).◄

►(b) An applicant may transmit the record copy to the International Bureau as provided in PCT Rule 22.2 only if the international application is filed with the United States Receiving Office before the expiration of 11 months from the priority date.◄

53. By adding a new § 1.465 to read as follows:

►§ 1.465 *Timing of application processing based on the priority date.*◄

►(a) For the purpose of computing time limits under the Treaty, the priority date shall be defined as in PCT Art. 2(xi).◄

►(b) When a claimed priority date is cancelled under PCT Rule 4.10(d) or considered not to have been made under PCT Rule 4.10(a), the priority date for the purposes of computing time limits will be the date of the earliest valid remaining priority claim of the international application, or if none, the international filing date.◄

►(c) When corrections under PCT Art. 11(2), Art. 14(2) or Rule 20.2(a)(i) or (iii) are timely submitted, and the date of receipt of such corrections falls later than one year from the claimed priority date or dates, the Receiving Office shall proceed under Rule 4.10(d).◄

54. By adding a new § 1.468 to read as follows:

►§ 1.468 *Delays in meeting time limits.*◄

►(a) Delays in meeting time limits during international processing of international applications may only be excused as provided in PCT Rule 82. For delays in meeting time limits in a national application see § 1.137.◄

►(b) In cases of unavoidable delay or loss in the mail during international processing of international applications, evidence may be offered only if the mail that was delayed or lost was registered by the postal authorities.◄

55. By adding a new § 1.471 to read as follows:

►§ 1.471 *Corrections and amendments during international processing.*◄

►(a) All corrections submitted to the United States Receiving Office must be in the form of replacement sheets and be accompanied by a letter that draws attention to the differences between the replaced sheets and the replacement sheets, except that the deletion of lines of text, the correction of simple typographical errors, and one addition or change of not more than five words per sheet may be stated in a letter and the United States Receiving Office will make the deletion or transfer the correction to the international application, provided that such corrections do not adversely affect the clarity and direct reproducibility of the application (PCT Rule 26.4).◄

►(b) Amendments of claims submitted to the International Bureau shall be as prescribed by PCT Rule 46.◄

56. By adding a new § 1.475 to read as follows.

►§ 1.475 *Changes in person, name, or address of applicants and inventors.*◄

►All requests for a change in person, name or address of applicants and inventors should be sent to the United States Receiving Office until the time of issuance of the international search report. Thereafter requests for such changes should be submitted to the International Bureau.◄

57. By adding § 1.481 to read as follows:

►§ 1.481 *Determination of Unity of Invention before the International Searching Authority.*◄

►(a) Before establishing the international search report, the International Searching Authority shall determine whether the international application complies with the requirement of unity of invention as set forth in PCT Rule 13. If the International Searching Authority considers that the international application does not so comply, it shall inform the applicant accordingly and request the payment of additional fees. (Note § 1.441 and PCT Art. 17(3)(a) and PCT Rule 40.)◄

►(b) The applicant will be given a time period in accordance with PCT Rule 40.3 to pay the additional fees due.◄

►(c) If the applicant disagrees with the holding of lack of unity of invention by the International Searching Authority, he may pay the additional fee under protest, that is accompanied by a request for refund and a statement setting forth his reasons for disagreement or why he considers the required additional fees excessive, or both (PCT Rule 40.2(c).◄

►(d) Protests under paragraph (c) of this section will be examined by the Commissioner or his designee. In the event that the applicant's protest is determined to be justified, the additional fees or a portion thereof will be refunded.◄

►(e) An applicant who desires that a copy of the protest and the decision thereon accompany the international search report when forwarded to the designated offices, may notify the International Searching Authority to that effect any time prior to the issuance of the international search report. Thereafter, such notifications should be directed to the International Bureau. (PCT Rule 40.2(c).)◄

►(f) The international search report will be established only on those parts of the international application which relate to the invention first mentioned in the claims ("main invention") and those other parts of the international applications which relates to inventions for which additional fees have been timely paid (PCT Art. 17(3)(a) and PCT Rule 40.3).◄

58. By adding § 1.482 to read as follows:

►§ 1.482 *Holding of lack of unity of invention.*◄

►(a) The International Search Authority may not raise the objection of lack of unity of invention merely because an application contains several claims of the same category or several claims of different categories related as under PCT Rules 13.2 and 13.3.◄

►(b) Lack of unity of invention may exist in a single claim where the claim contains alternatives which are not linked by a single general inventive concept (PCT Rule 13.1).◄

►(c) Lack of unity of invention may be directly evident before considering the claims in relation to any prior art, or after taking the prior art into consideration, as where a document discovered during the search shows the invention claimed in a generic or linking claim lacks novelty or is clearly obvious, leaving two or more claims joined thereby without a common inventive concept. In such a case the International Searching Authority may raise the objection of lack of unity of invention (and limit the search to the invention first mentioned if no additional fees are paid).◄

►(d) Occasionally in cases which lack unity of invention, the examiner will be able to make a complete search for all inventions with negligible additional work, in particular when the inventions are conceptually very close and none of them requires a search in separate classification units. In those cases, the search for the additional inventions should be completed together with that for the invention first mentioned. All results should then be included in a single search report, and no objection of lack of unity should ordinarily be raised.◄

►(e) For unity of invention practice at the national stage see §§ 1.141–1.146.◄

59. By adding a new § 3.56 to read as follows:

►**§ 3.56** ***Oath to be filed with United States Designated Office under 35 U.S.C. 371(c)(4).***◄

►As a below-named inventor, being duly sworn (or affirmed), I depose and say that:

My residence, post office address and citizenship are as stated below next to my name;

I verily believe I am the original, first and sole inventor (if only one name is listed below) or a joint inventor (if plural inventors are named below) of the invention entitled: _____ described and claimed in international application number _____ filed _____, and as amended on _____ (if any), for which I solicit a patent;

I do not know and do not believe the same was ever known or used in the United States of America before my or our invention thereof, or patented or described in any printed publication in any country before my or our invention thereof or more than one year prior to my international application, that the same was not in public use or on sale in the United States of America more than one year prior to my international application, that the invention has not been patented or made the subject of an inventor's certificate issued before the date of my international application in any country foreign to the United States of America on an application filed by me or my legal representatives or assigns more than twelve months prior to my international application, and that no application for patent or inventor's certificate on this invention has been filed in any country foreign to the United States of America prior to this application by me or my legal representatives or assigns except as follows: _____

_____

_____

(Full name of sole or first inventor)

_____ Date _____

(Inventor's signature)

_____

(Residence)

_____

(Citizenship)

_____

(Post Office Address)

_____

_____

(Full name of second joint inventor, if any)

_____ Date _____

(Inventor's signature)

_____

(Residence)

_____

(Citizenship)

_____

(Post Office Address)

_____

(Supply similar information and signature for third and subsequent joint inventors)

_____ } ss:
_____ }

Sworn to and subscribed before me this _____ day of _____, 19__.

_____

(Signature of notary or officer)

[SEAL]

_____

(Official character) ◄

60. By adding a new § 3.57 to read as follows:

►**§ 3.57** ***Declaration to be filed with United States Designated Office under 35 U.S.C. 371(c)(4).***◄

►As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name;

I verily believe I am the original, first and sole inventor (if only one name is listed below) or a joint inventor (if plural inventors are named below) of the invention entitled: _____ described and claimed in international application number _____ filed _____ and as amended on _____ (if any), for which I solicit a patent;

I do not know and do not believe the same was ever known or used in the United States of America before my or our invention thereof, or patented or described in any printed publication in any country before my or our invention thereof or more than one year prior to my international application, that the same was not in public use or on sale in the United States of America more than one year prior to my international application, that the invention has not been patented or made the subject of any inventor's certificate issued before the date of my international application in any country foreign to the United States of America on an application filed by me or my legal representatives or assigns more than twelve months prior to my international application, and that no application for patent or inventor's certificate on this invention has been filed in any country foreign to the United States of America prior to this application by me or my legal representatives or assigns, except as follows: _____

_____

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

_____

(Full name of sole or first inventor)

_____ Date _____

(Inventor's signature)

_____

(Residence)

_____

(Citizenship)

_____

(Post Office Address)

_____

_____

(Full name of second joint Inventor, if any)

_____ Date _____

(Inventor's signature)

_____

(Residence)

_____

(Citizenship)

_____

(Post Office Address) ◄

_____

61. By revising § 5.1 to read as follows:

§ 5.1 *Defense inspection of certain applications.*

►(a) The provisions of this part shall apply to both national and international applications filed in the Patent and Trademark Office except as otherwise specifically indicated. The filing of an international application designating a foreign country is considered to be a filing in a foreign country within the meaning of Chapter 17 of Title 35, United States Code.◄

►(b)◄ In accordance with the provisions of 35 U.S.C. 181, patent applications containing subject matter the disclosure of which might be detrimental to the national security are made available for inspection by defense agencies as specified in said section. Only applications obviously relating to national security, and applications within fields indicated to the Patent and Trademark Office by the defense agencies as so related, are made available. The inspection will be made only by responsible representatives authorized by the agency to review applications. Such representatives are required to sign a dated acknowledgement of access accepting the condition that information obtained from the inspection will be used for no purpose other than the administration of 35 U.S.C. 181–188. Copies of applications may be made available to such representatives for inspection outside the Patent and Trademark Office under conditions assuring that the confidentiality of the applications will be maintained, including the conditions that: (a) All copies will be returned to the Patent and Trademark Office promptly if no secrecy order is imposed, or upon rescission of such order if one is imposed, and (b) no additional copies will be made by the defense agencies. A record of the removal and return of copies made available for defense inspection will be maintained by the Patent and Trademark Office. Applications relating to atomic energy are made available to the [Atomic Energy Commission] ►Energy Research and Development Administration◄ as specified in § 1.14 of this chapter.

62. By revising § 5.3 to read as follows:

§ 5.3 *Prosecution of application under secrecy order; withholding patent.*

Unless specifically ordered otherwise, action on the application by the Office and prosecution by the applicant will proceed during the time an application is under secrecy order to the point indicated in this section:

(a) ►National◄ applications under secrecy order which come to a final rejection must be appealed or otherwise prosecuted to avoid abandonment. Appeals in such cases must be completed by the applicant but unless otherwise specifically ordered by the Commissioner will not be set for hearing until the secrecy order is removed.

(b) An interference will not be declared involving ►national◄ applications under secrecy order. However, if an application under secrecy order copies claims from an issued patent, a notice of that fact will be placed in the file wrapper of the patent.

(c) When the ►national◄ application is found to be in condition for allowance except for the secrecy order the applicant and the agency which caused the secrecy order to be issued will be notified. This notice (which is not a notice of allowance under § 1.311 of this chapter) does not require response by the applicant and places the ►national◄ application in a condition of suspension until the secrecy order is removed. When the secrecy order is removed the Patent and Trademark Office will issue a notice of allowance under § 1.311 of this chapter, or take such other action as may then be warranted.

►(d) International applications under secrecy order will be processed up to the point where the record and search copies are ready to be forwarded. However, the copies will not be forwarded to the Authorities or delivered to the applicant.◄

63. Section 5.11 is revised to read as follows:

§ 5.11 *License for filing application in foreign country ►or for filing international application.◄*

(a) When no secrecy order has been issued under § 5.2, a license from the Commissioner of Patents and Trademarks under 35 U.S.C. 184 is required before filing any application for patent or for the registration of a utility model, industrial design, or model, in a foreign country, ►or filing an international application,◄ or causing or authorizing such filing, with respect to an invention made in the United States, if:

(1) The foreign application ►or international application◄ is to be filed ►,◄ or its filing caused or authorized ►,◄ before [an] ►a national◄ application for patent is filed in the United States, or

(2) The foreign application ►or international application◄ is to be filed, or its filing caused or authorized, prior to the expiration of six months from the filing of the ►national◄ application in the United States.

(b) When there is no secrecy order in effect, a license under 35 U.S.C. 184 is not required if;

(1) The invention was not made in the United States, or

(2) The foreign application ►or international application◄ is to be filed, or its filing caused or authorized, after the expiration of six months from the filing of the ►national◄ application in the United States.

(c) When a secrecy order has been issued under § 5.2, an application cannot be filed in a foreign country ►, nor can an international application be filed,◄ in any case except in accordance with § 5.5.

64. By revising paragraphs (b) and (c) of § 5.14 to read as follows:

§ 5.14 *Petition for license; corresponding U.S. application.*

* * * * *

(b) Two or more United States applications should not be referred to in the same petition for license unless they are to be combined in the foreign ►or international◄ application, in which event the petition should so state and the identification of each United States application should be in separate paragraphs.

(c) Where the application to be filed abroad ►or the international application◄ contains matter not discussed in the United States application or applications, including the case where the combining of two or more United States applications introduces subject matter not disclosed in any of them, a copy of the application as it is to be filed in the foreign country ►or international application as it is to be filed in the Receiving Office◄ must be furnished with the petition. If, however, all new matter in the ►foreign or international◄ application to be filed is readily identifiable, the new matter may be submitted in detail and the remainder by reference to the pertinent United States application or applications.

65. By revising § 5.15 to read as follows:

§ 5.15 *Scope of license.*

(a) A license to file an application in a foreign country ►or to file an international application◄, when granted, includes authority to forward all duplicate and formal papers to the foreign country ►or international authorities◄ and to make amendments and take any action in the prosecution of the ►foreign or international◄ application, provided subject matter additional to that covered by the license is not involved. In those cases in which no license is required to file the foreign ►or international◄ application, no license is required to file papers in connection with the prosecution of the foreign ►or international◄ application not involving disclosure of additional subject matter. Any paper filed abroad ►or before an international authority◄ following the filing of a foreign ►or international◄ application which involves the disclosure of additional subject matter must be separately licensed in the same manner as ►a foreign or international◄ [an] application.

* * * * * *

66. By revising § 5.17 to read as follows:

§ 5.17 *Who may use license.*

Licenses may be used by anyone interested in the foreign ►or international◄ filing for or on behalf of the inventor or his assigns.

Date: December 23, 1976.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Approved:

BETSY ANCKER-JOHNSON, PH.D.
Assistant Secretary for Science and Technology.

Date. Jan. 6, 1977.

[FR Doc. 77–1024; Filed 1–11–77; 8.45 am]
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Removal From Register

Pursuant to the provisions of 37 CFR 1.347 a letter was directed on February 12, 1976, to the last post office address furnished to the Committee on Enrollment by all of the persons registered to practice before the Patent and Trademark Office in patent cases. A list of the names and addresses of persons being removed for failure to respond to the letter within the period of forty-five days therein set was published in the August 10, 1976 OFFICIAL GAZETTE, vol. 949, page 414.

The following persons, whose names appeared in that list have been removed from the active Register of Attorneys and Agents, effective December 31, 1976.

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Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,740,265, J. R. Bayston, MACHINE FOR MANUFACTURING ICE CUBES; **2,763,993,** same, ICECUBE MANUFACTURING APPARATUS; **3,009,336,** Bayston and Kuebler, ICE MAKING MACHINE, **filed** July 2, 1975, D.C., N.D. Ill. (Chicago) Doc. 75c2182, *Uniflow Manufacturing Co. and Icecrafer Trust* v. *Liquid Carbonic.* By stipulation order the complaint be dismissed with prejudice as to U.S. Patents 2,740,265 and 2,763,993 and be dismissed without prejudice as to U.S. Patent 3,009,336, Sept. 21, 1976.

2,763,993. (See 2,740,265.)

3,009,336. (See 2,740,265.)

3,151,503, Keller and Keller, TRANSMISSION SYSTEM; **3,231,117,** Melroe and Keller, TRACTOR VEHICLE AND DRIVE THEREFOR; **D. 195,254,** Keller, Keller and Melroe, SELF-PROPELLED LOADER, **filed** Sept. 23, 1976, D.C. N. Dak. (Fargo) Doc. 4839, *Louis J. Keller and Cyril N. Keller* v. *Clark Equipment Company and Clark Equipment, A.G.* Judgment, court found Patent 3,231,117 to be invalid and that Patents 3,151,503 and D. 195,254 have not been proved to be invalid, Sept. 23, 1976. **Same, filed** Sept. 23, 1976, D.C. N. Dak. (Fargo) Doc. 4875, *Clark Equipment Company* v. *Louis J. Keller and Cryril N. Keller.* Judgment, court found Patent 3,231,117 to be invalid; and that Patents 3,151,503 and D. 195,254 have not been proved to be invalid, Sept. 23, 1976.

3,159,916, L. Hunter, VEHICLE WHEEL ALIGNMENT APPARATUS; **3,206,862,** same, **filed** Oct. 22, 1974, D.C., N.D. Ill. (Chicago) Doc. 74c3030, *Lee Hunter and Hunter Engineering* v. *FMC Corporation.* It is hereby ordered that this action be dismissed without prejudice subject to reinstatement as a Motion of Course, June 26, 1975.

3,188,468, L. E. Packard, METHOD AND APPARATUS FOR AUTOMATIC STANDARDIZATION IN LIQUID SCINTILLATION SPECTROMETRY, **filed** Dec. 16, 1970, D.C., N.D. Ill. (Chicago) Doc. 70c3150, *Packard Instrument Co.* v. *Beckman Instruments Inc.* Pursuant to stipulation, cause dismissed between plaintiff and defendant. Third party action pending, Apr. 3, 1973; motion for voluntary dismissal of third party complaint granted, Apr. 6, 1973.

3,206,862. (See 3,159,916.)

3,231,117. (See 3,151,503.)

3,486,201, W. Bourne, CABLE AND LIKE BINDING CLIPS, **filed** Sept. 24, 1976, D.C., N.D. Ill. (Chicago) Doc. 76c3574, *Bowthorpe-Hellermann Limited* v. *All States Plastic Manufacturing Company, Inc.*

3,547,108, S. V. Seiffert, COMBINATION DEFIBRILLATOR AND HEARTBEAT MONITORING SYSTEM, **filed** June 12, 1972, D.C., N.D. Ill. (Chicago) Doc. 72c1456, *Physio-Control Corp.* v. *Gould, Inc.* Order, Physio-Control Corp. is severed and hereby cause is dismissed with prejudice, Dec. 5, 1974.

3,577,825, H. E. Reusser, BOLT ANCHOR AND METHOD FOR MAKING SAME, **filed** Sept. 7, 1976, D.C., N.D. Ohio (Akron) Doc. C76-278A, *The Eastern Co., by and through its division, Frazer & Jones Co.* v. *Gottschall Tool & Die, Inc. and George W. Allen.*

3,599,030, D. A. Armstrong, ANNULAR SURFACE GAP SPARK PLUG, **filed** June 14, 1976, D.C., N.D. Ill. (Chicago) Doc. 76c2193, *Brunswick Corporation* v. *Champion Spark Plug Company.*

3,601,609, W. L. Yauger, Jr., IONIZATION DETECTION DEVICE USING A NICKEL-63 RADIOACTIVE SOURCE, **filed** Mar. 6, 1972, D.C., N.D. Ill. (Chicago) Doc. 72c580, *Tracor, Inc.* v. *Hewlett-Packard Co. et al.* Final judgment and writ of permanent injunction, defendant is hereby permanently enjoined from infringing upon said Letters Patent, Nov. 11, 1975.

3,620,367, O. G. Stembel, CASSETTE STORAGE CONTAINER, **filed** Mar. 5, 1975, D.C., N.D. Ill. (Chicago) Doc. 75c0715, *Dudley A. Olsen and Oren G. Stembel* v. *Industrial Audio/Film Service, Inc.* By agreement it is ordered that this cause of action be and hereby is dismissed without prejudice, Feb. 25, 1976.

3,646,696, R. Sarkisian, POSTER DISPLAY DEVICE; **3,662,482,** same, **filed** Dec. 10, 1975, D.C. Oreg. (Portland) Doc. C–75–1131, *Robert Sarkisian v. Winn-Proof Corporation et al.* Judgment of permanent injunction entered against defendants, Sept. 23, 1976.

3,671,006, Berkowitz and Ahrendt, REFRIGERATOR WALL PANELS WITH PANEL FASTENERS AND APPARATUS FOR MAKING SAID PANELS, **filed** Oct. 28, 1975, D.C., N.D. Ill. (Freeport) Doc. 75,0053, *Kason Hardware Corp. v. National Lock Hardware Co. and Keystone Consolidated Industries, Inc.* Case dismissed by stipulation, parties reached satisfactory accord. Case dismissed with prejudice, Oct. 5, 1976.

3,675,247, J. O. Ferrell, METHOD FOR FABRICATING PANTY HOSE, **filed** Sept. 3, 1976, D.C., M.D.N.C. (Greensboro), Doc. C–76–464–G, *Tights, Inc. v. Best Wear Hosiery Mills, Inc.* **Same, filed** Sept. 3, 1976, D.C., M.D.N.C. (Greensboro) Doc. C–76–465–G, *Tights, Inc. v. Dependable Hosiery Mills, Incorporated.*

3,675,247, J. O. Ferrell, METHOD FOR FABRICATING PANTY HOSE; **Re. 25,360,** E. G. Rice, COMBINATION STOCKINGS AND PANTY, **filed** Oct. 5, 1976, D.C., M.D.N.C. (Greensboro) Doc. C–76–525–G, *Tights, Inc. v. Liberty Hosiery Mills, Inc.*

3,771,430, R. W. Lane, LOUVER ASSEMBLY, **filed** Sept. 14, 1976, D.C., S.D.N.Y., Doc. 76–C–4079, *Airolite Co. v. Arrow, Louver and Damper.*

3,814,937, A. R. Lowes, PULSE PILE-UP REJECTOR WITH LIVE-TIME CORRECTOR CIRCUIT, **filed** Sept. 2, 1976, D.C., N.D. Calif. (San Francisco) Doc. C–76–1877–AJZ, *Kevex Corporation v. Canberra Industries, Inc.*

3,837,981, T. R. Flint, EPOXY TAPE, **filed** Oct. 6, 1976, D.C., N.D. Ga. (Atlanta) Doc. C76–1657A, *Theodore R. Flint and Polymeric Systems, Inc. v. Dynatron Bondo Corporation.*

3,852,790, J. A. Robinson, UNIVERSAL MOUNT FOR ELECTRONIC FLASH UNIT, **filed** Mar. 20, 1975, D.C., N.D. Ill. (Chicago) Doc. 75c923, *Acme-Lite Manufacturing Co. v. International Telephone & Telegraph Corp.* On the stipulation of the parties, order above law dismissed with prejudice, Dec. 23, 1975.

3,867,806, Lancaster III and Lancaster, PROCESS OF MAKING A STRETCHED-WRAPPED PACKAGE, **filed** Sept. 1, 1976, D.C.N.J. (Newark) Doc. C–76–1713, *Lantech Inc. v. Packaging Sales and Development Corporation.*

3,883,845, P. M. Devita, SIGNAL LIGHT ADAPTER FOR TRAILERS, **filed** May 10, 1976, D.C., N.D. Ga. (Atlanta) Doc. C76–824A, *Peter Michael Devita v. Leisure Components Corporation; Arnold Leanse & Associates and John Berford.*

3,908,407, Brand and Hubbard, LADIES' KNEE-HIGH STOCKING WITH SUPPORTING CUFF, **filed** Nov. 19, 1975, D.C., W.D.N.C. (Statesville) Doc. ST–C–75–58, *Americal Corporation v. Ridgeview Hosiery Mill Co., Inc.* It is hereby stipulated and agreed by and between the parties hereto, that this action including the counterclaims asserted therein, is hereby dismissed with prejudice, Aug. 19, 1976.

3,913,250, A. T. Spees, FILLING SYSTEM AND ELEMENTS THEREFOR, **filed** Apr. 16, 1976, D.C., C.D. Calif. (Los Angeles) Doc. CV76–1256–RF, *View-Flex Company, Incorporated v. Bell & Howell Company.*

3,924,750, R. S. Dunchock, EYEGLASS DISPLAY UNIT, **filed** May 13, 1976, D.C., N.D. Calif. (San Francisco) Doc. C–76–0981–CBR, *Optarac Corporation v. Optivest Corporation.*

3,928,933, T. Iwamoto, HOLDING TOY, **filed** Sept. 29, 1976, D.C., N.D. Calif. (San Francisco) Doc. C–76–2132–ACW, *ITI Hawaii, Inc. and Takeji Iwamoto v. Gems of the Golden West and Jack B. Neuman and Florence C. Neuman.*

3,949,707, Armstrong and Kounkel, LIVESTOCK WATERING SYSTEM, **filed** Aug. 16, 1976, D.C., S.D. Iowa (Des Moines) Doc. 76–260–2, *Confinement Livestock Systems, Inc. v. Total Livestock Confinement, Inc. et al.*

3,965,399, Walker, Jr. and Shevlin, PUSHBUTTON CAPACITIVE TRANSDUCER, **filed** Sept. 8, 1976, D.C., W.D. Wash. (Seattle) Doc. C76–617, *Key Tronic Corporation v. Controls Technology Corp. and Automix Keyboards, Inc.*

3,978,596, Brown and Brown, SANDALS AND METHOD OF MAKING SAME, **filed** Sept. 28, 1976, D.C., N.D. Tex. (Dallas) Doc. CA3–76–1302, *Dwight C. Brown and Kevin B. Brown, doing business as Tiddies Company v. E.S. Originals, Inc.*

Re. 25,360. (See 3,675,247.)

Re. 28,480, V. Petrusek, INFLATABLE BOXING GLOVE OR PILLOW, **filed** Nov. 3, 1975, D.C., N.D. Ill. (Chicago) Doc. C3715, *Centsable Products, Inc. et al. v. Spiegel of Illinois, Inc. et al.* Consent decree, defendants are hereby permanently enjoined and restricted from doing any act which infringes said reissue, Mar. 29, 1976.

D. 195,254. (See 3,151,503.)

PATENT NOTICES

Certificates of Correction for the Week of Feb. 8, 1977

Re. 28,617	3,956,283	3,979,788	3,990,902
3,667,250	3,957,814	3,980,394	3,990,950
3,675,881	3,957,834	3,980,530	3,991,065
3,753,678	3,958,980	3,980,583	3,991,572
3,673,021	3,960,278	3,980,712	3,991,607
3,763,069	3,960,476	3,980,778	3,991,936
3,819,745	3,960,845	3,981,426	3,991,944
3,829,504	3,962,178	3,981,752	3,991,955
3,833,649	3,964,550	3,981,760	3,992,051
3,856,808	3,965,183	3,981,924	3,992,063
3,870,046	3,965,760	3,981,953	3,992,106
3,900,823	3,966,873	3,983,099	3,992,182
3,904,761	3,967,004	3,983,443	3,992,238
3,905,022	3,968,861	3,984,095	3,992,422
3,905,863	3,968,888	3,984,610	3,992,470
3,909,721	3,969,542	3,985,128	3,992,724
3,914,712	3,970,186	3,985,278	3,992,966
3,915,577	3,970,286	3,985,593	3,993,109
3,919,508	3,971,223	3,985,766	3,993,129
3,922,276	3,972,014	3,985,808	3,993,361
3,923,862	3,972,551	3,985,885	3,993,377
3,923,863	3,972,894	3,987,690	3,993,417
3,923,864	3,973,825	3,988,678	3,994,152
3,927,185	3,973,839	3,988,699	3,994,554
3,936,487	3,975,083	3,989,203	3,994,758
3,946,029	3,976,623	3,989,236	3,994,804
3,949,549	3,977,337	3,989,524	3,994,954
3,950,733	3,977,819	3,990,431	3,995,092
3,951,177	3,978,028	3,990,490	3,995,239
3,951,292	3,978,147	3,990,562	3,995,258
3,951,849			
3,954,995	3,978,474	3,990,662	3,995,768
3,955,927	3,978,679	3,990,826	3,996,228

Availability of Consolidated Listings

The "Consolidated Listing of Recent Official Gazette Notices—Re Patent and Trademark Office Practices and Procedures," Patent Section and Trademark Section which appeared in the OFFICIAL GAZETTE of January 4, 1977, are available from the Superintendent of Documents, Washington, D.C. 20402. Please include the following information when ordering:

Patent Section—Stock No. 003-004-00539-4, cost $.70
Trademark Section—Stock No. 003-004-00540-8, cost $1.10.

There is a minimum charge of $1.00 for each mail order.

RICHARD J. SHAKMAN,
Assistant Commissioner for Administration.

Jan. 18, 1977.

Disclaimers and Dedications

3,205,390.—*Edward Emanuel Sheldon,* New York, N.Y. ENDOSCOPIC INSTRUMENTS. Patent dated Sept. 7, 1965. Disclaimer and dedication filed Nov. 1, 1976, by the assignee, *American Optical Corporation.*

Hereby disclaims and dedicates to the Public the remaining term of said patent.

3,305,690.—*Edward Emanuel Sheldon,* New York, N.Y. ELECTRON DISCHARGE DEVICE WITH FIBER OPTIC END WALL. Patent dated Feb. 21, 1967. Disclaimer and dedication filed Nov. 1, 1976, by the assignee, *American Optical Corporation.*

Hereby disclaims and dedicates to the Public the remaining term of said patent.

3,440,313.—*Walter E. Schmocker,* Chagrin Falls, Ohio. PROCESS OF MAKING RUBBER-TIPPED VALVE ELEMENT. Patent dated Apr. 22, 1969. Disclaimer and dedication filed Dec. 15, 1976, by the assignee, *Industrial Electronic Rubber Company.*

Hereby disclaims and dedicates to the Public all claims of said patent.

Disclaimers

3,578,452.—*Konrad Parker,* Park Ridge, Ill. DEVELOPING COMPOSITIONS FOR DIAZOTYPE MATERIALS. Patent dated May 11, 1971. Disclaimer filed Oct. 27, 1976, by the assignee, *Addressograph-Multigraph Corporation.*

Hereby enters this disclaimer to claims 1, 2 and 5 of said patent.

3,587,177.—*William F. Overly,* Winneconne, and *Kenneth J. Pagel,* Neenah, Wis. AIRFOIL NOZZLE. Patent dated June 28, 1971. Disclaimer filed Dec. 10, 1976, by the assignee, *Overly, Inc.*

Hereby enters this disclaimer to claims 1, 2, 5 and 6 of said patent.

3,918,796.—*James L. Ferguson,* Kent, Ohio. LIQUID-CRYSTAL NON-LINEAR LIGHT MODULATORS USING ELECTRIC AND MAGNETIC FIELDS. Patent dated Nov. 11, 1975. Disclaimer filed July 2, 1976, by the assignee, *Hoffmann-La Roche Inc.*

The term of this patent subsequent to May 8, 1990 has been disclaimed.

3,934,999.—*Harold R. Meier,* Minneapolis, Minn. COMPOSTING METHOD AND APPARATUS. Patent dated Jan. 27, 1976. Disclaimer filed Dec. 13, 1976, by the assignee, *Judd Ringer Corporation.*

Hereby enters this disclaimer to claim 7 of said patent.

3,966,811.—*John Krenzer,* Oak Park, Ill. DIALKYL ACETALS OF ANILINOACETALDEHYDES. Patent dated June 29, 1976. Disclaimer filed Dec. 17, 1976, by the assignee, *Velsicol Chemical Corporation.*

Hereby enters this disclaimer to claims 1, 2, 3, 4, 5, 6, 7 and 8 of said patent.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF DECEMBER 18, 1976

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	2-2-76
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	4-22-76
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	11-11-75
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	2-11-76
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-8-76
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	8-12-75
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	2-19-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	12-17-75
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	6-21-76
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	1-22-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	6-10-75
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	2-26-76
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	5-5-76
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	3-1-76
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	1-12-76
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors: Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	5-20-76

Expiration of patents: The patents within the range of numbers indicated below expire during January 1977, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,919,443 to 2,923,007 inclusive
Plant Patents..... Numbers 1,893 to 1,900, inclusive

REISSUES

FEBRUARY 8, 1977

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 29,133

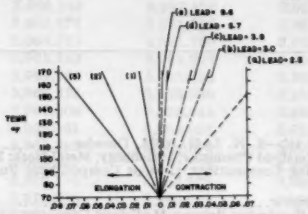
CONSTANT LENGTH COMPOSITE GLASS FIBER CABLE UNDER VARYING TEMPERATURE CONDITIONS

Donald L. Snellman, and Willard G. Hudson, both of Seattle, Wash., assignors to Norfin, Inc., Seattle, Wash.

Original No. 3,821,879, dated July 2, 1974, Ser. No. 311,361, Dec. 1, 1972. Application for reissue Feb. 18, 1975, Ser. No. 550,299

Int. Cl.² D02G *3/18, 3/40*

U.S. Cl. 57—140 G **13 Claims**



1. A composite cable structure composed of multiple layers of helically wound glass fiber rovings with each of the glass [fibers] *filaments* making up each roving completely surrounded by a cured elastomeric sheath bonded to the elastomeric sheaths surrounding adjacent filaments of both the same and adjacent rovings, each layer of roving having the same helical angle as the initial and adjacent layers of roving, the helical angle selected to produce a cable of controlled elongation over a wide temperature range under varying tensile loads.

6. A method of making a composite cable structure composed of multiple layers of helically wound glass fiber rovings with each of the glass [fibers] *filaments* making up each roving completely surrounded by a cured elastomeric sheath, the composite cable capable of maintaining substantially constant length under varying temperature conditions, comprising:

twisting a plurality of glass fiber rovings, the glass [fibers] *filaments* of which are individually coated with an uncured elastomeric resin incorporating a curing agent or hardener therein to form an initial lay-up,

twisting further layers of glass fiber rovings, the glass [fibers] *filaments* of which are coated with an uncured elastomeric resin, around the initial lay-up in the same direction until a cable of desired cross-sectional diameter is obtained, and

maintaining the helical angle of the initial and subsequent rovings during lay-up constant and no greater than about 12°.

Re. 29,134

POLYIMIDE PRECURSOR AND METHOD AND COMPOSITION FOR PREPARING IT

Leonard E. Edelman, and William M. Alvino, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Original No. 3,853,813, dated Dec. 10, 1974, Ser. No. 363,771, May 24, 1973. Application for reissue Apr. 30, 1975, Ser. No. 573,285

Int. Cl.² C08G *73/10*

U.S. Cl. 260—47 CB **29 Claims**

1. A method of making a soluble polyimide precursor comprising:

1. preparing a composition which comprises:

(a) a dianhydride and a tetracarboxylic acid in the proportions of about 50 to about 70 mole percent dianhydride and about 30 to about 50 mole percent tetracarboxylic acid;

(b) a stoichiometric amount of an aromatic diisocyanate; and

(c) a solvent for said dianhydride, said tetracarboxylic acid, said aromatic diisocyanate, and said polyimide precursor in an amount sufficient to make a solution having a solids content of about 12 to about 25 percent;

2. heating said composition at about 30 to about 70° C until the evolution of carbon dioxide substantially ceases; and

3. heating said composition at about 30 to about 100° C until its viscosity is about [Z] *Q* to about Z6 on the Gardner-Holdt viscosity scale at 18 percent solids.

Re. 29,135

SEQUENTIAL TO SIMULTANEOUS CONVERSION SYSTEM

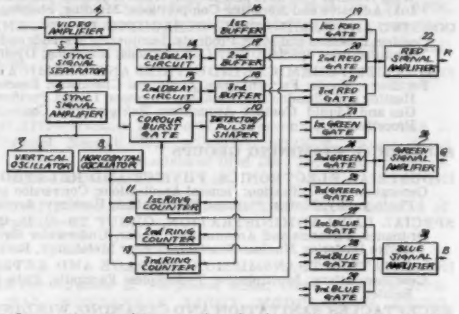
Yasumasa Sugihara, Kawasaki, Japan, assignor to The General Corporation, Japan

Original No. 3,507,982, dated Apr. 21, 1970, Ser. No. 581,021, Sept. 21, 1966. Application for reissue Mar. 19, 1976, Ser. No. 668,405

Claims priority, application Japan, Oct. 1, 1965, 40-59736

Int. Cl.² H04N *9/42*

U.S. Cl. 358—11 **2 Claims**



1. In a color television receiver having a shadow-mask color picture tube for reproducing simultaneously applied color signals from line-sequential recorded image signals, the combination comprising a video amplifier for amplifying a line-sequential color television signal, a first delay circuit connected to the output of said video amplifier and for delaying the output signals thereof by one horizontal scanning period, a second delay circuit connected to the output of said first delay circuit and for delaying the output signals to said video amplifier by two horizontal scanning periods, three ring counters for generating by turns a square wave having a pulse width of one horizontal scanning period in each three horizontal scanning period with said square wave being produced in each different horizontal scanning period of three horizontal scanning periods, gate circuits for red signals connected to each output of said video amplifier and of said delay circuits and for passing the continued red signals from said each output in each three horizontal scanning period by means of the output signals of said three ring counters, gate circuits for blue signals connected to each output of said video amplifier and of said delay circuits and for passing the continued blue signals from each output in each three horizontal scanning period by means of the output signals of said three ring counters, gate circuits for green signals connected to each output of said video amplifier and of said delay circuits and for passing the continued green signals from said each output in each signals of said three ring counters, and amplifiers for amplifying the respective outputs of said each gate circuit to a level sufficient to reproduce a color image on said color picture tube.

PLANT PATENTS

GRANTED FEBRUARY 8, 1977

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,015
YELLOW ROSE PLANT

Roy L. Byrum, Richmond, Ind., assignor to Joseph H. Hill Company, Richmond, Ind.

Filed Mar. 1, 1976, Ser. No. 662,886
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—15 1 Claim

1. A new and distinct rose plant variety substantially as herein shown and described, characterized by the distinctive yellow color and the strong tea fragrance of its flowers, its vigorous growth, and its year around abundant production of blooms on strong upright stems.

4,016
ROSE PLANT

Roy L. Byrum, Richmond, Ind., assignor to Joseph H. Hill Company, Richmond, Ind.

Filed Mar. 1, 1976, Ser. No. 662,887
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—25 1 Claim

1. A new and distinctive variety of rose plant substantially as herein shown and described, characterized by the distinctive Nasturtium Red to Empire Rose general color effect of the open flowers, by its slightly spicy flower fragrance, its abundant and continuous flower production, and its vigorous year around growth habit.

REISSUES

FEBRUARY 8, 1977

PATENTS

GRANTED FEBRUARY 8, 1977

ERRATA

For CLASS	See PATENT NO.
290–055	4,006,925
305–012	4,006,940
429–206	4,007,054
423–565	4,007,055
429–222	4,007,056
429–057	4,007,057
429–034	4,007,058
429–009	4,007,059
429–053	4,007,060
148–105	4,007,072
148–120	4,007,073
148–175	4,007,074
536–017	4,007,166
536–017	4,007,167
358–280	4,007,326
358–160	4,007,327
358–085	4,007,328
235–101	4,007,359
219–385	4,007,367
219–388	4,007,368
219–390	4,007,369
219–521	4,007,370
219–523	4,007,371
343–225	4,007,455

PATENTS

GRANTED FEBRUARY 8, 1977

ERRATA

For CLASS	See PATENT NO.
260-055	4,006,925
305-012	4,006,940
429-206	4,007,054
429-505	4,007,055
429-222	4,007,056
429-057	4,007,057
429-034	4,007,058
429-009	4,007,059
429-053	4,007,060
148-105	4,007,072
148-120	4,007,073
148-175	4,007,074
336-017	4,007,166
336-017	4,007,167
358-280	4,007,326
358-160	4,007,327
358-085	4,007,328
235-101	4,007,395
219-385	4,007,367
219-382	4,007,368
219-360	4,007,369
219-521	4,007,370
219-523	4,007,371
361-225	4,007,455

PATENTS

GRANTED FEBRUARY 8, 1977

NOTE—A cross reference listing of applications published under the second Trial Voluntary Protest Program is located in the back of this Issue. These entries will be in numerical order by document publication number.

GENERAL AND MECHANICAL

4,006,494
PANTS WITH FRONT POCKET
E. Roy Knoppel, 800 SW. 17th St., Boca Raton, Fla. 33432
Filed Jan. 26, 1976, Ser. No. 652,619
Int. Cl.[2] A41D *1/06, 27/20*
U.S. Cl. 2—227 **5 Claims**

1. In a pair of pants or slacks having a waistband at the top, a crotch spaced below the waistband, a front panel between the waistband and the crotch, and a pair of legs, the improvement which comprises:

a front pocket joined directly to said front panel and extending from side to side across the front thereof for at least substantially the width of the pants between the respective centerlines of its legs;

said pocket having a back panel and a front panel which are joined to each other and disconnected from said front panel of the pants at the lower edge and along the opposite side edges up from said lower edge of the pocket, whereby to provide a flap at the lower end of the pocket that is foldable up in front of the upper portion of the pocket;

said pocket having a substantially horizontal top opening extending from side to side across substantially the full width of the pocket, and a slide fastener extending across said top opening;

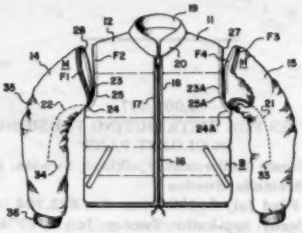
said front and back panels of the pocket being stitched at their upper ends to said front panel of the pants;

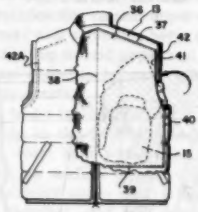
said top opening in the pocket being spaced below the stitched upper end of said front and back panels of the pocket;

and said front and back panels of the pocket being stitched to said front panel of the pants down along the opposite side edges of the pocket from the upper end of said front and back panels of the pocket to a location more than half-way down the pocket.

4,006,495
COAT CONSTRUCTION
John Roger Jones, 206 8th Ave., Salt Lake City, Utah 84102
Filed Sept. 15, 1975, Ser. No. 613,456
Int. Cl.[2] A41D *1/02*
U.S. Cl. 2—93 **3 Claims**

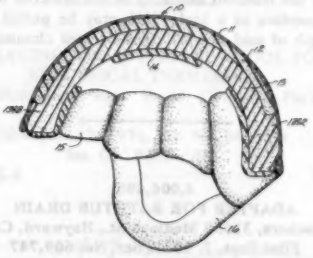
2. A coat garment including, in combination, a coat body having opposite arm apertures; a pair of semi-detachable sleeves having upper arm-hole margins provided with lower-rear portions solely permanently attached to said coat body proximate said arm apertures, said sleeves also having respective, elongate, arm removal and replacement, mutually and releasably closable longitudinal margins extending longitudinally along said sleeves, said longitudinal margins being so provided with means for so releasably closing said longitudinal margins; and means for releasably securing said sleeves along remaining portions of said upper margins to said coat body, about and over said arm apertures for closed registry therewith, said longitudinal margins respectively extending to said





remaining portions to form extensions thereof, and wherein said coat body is provided with interior pockets releasably receiving said sleeves, respectively, when in stored condition therein.

4,006,496
SAFETY HELMET
Peter O. Marker, La Habra, Calif., assignor to Land Tool Company, Wichita, Kans.
Filed Aug. 13, 1975, Ser. No. 604,190
Int. Cl.[2] A42B *3/00*
U.S. Cl. 2—414 **6 Claims**



1. A safety helmet comprising an outer shell shaped to be worn on the head of a user and constructed of a preselected lightweight material having a high flexural modulus for distributing an impact load,

a shock absorbing liner including integral stiffening pads adapted to be carried by the shell,

the stiffening pads being constructed and defined to cover the brow areas and rear areas of the shell when the helmet is worn on the head of the user and extending in contact with the inner wall of the shell at said edges, and

a resilient shock dampening layer arranged between the inner wall of the shell and the outer surface of the shock absorbing liner and extending coextensively with the

inner wall of the shell to said stiffening pads for the shock absorbing liner, the resilient layer and shock absorbing liner being arranged in a close friction fit with the inside wall of the shell,

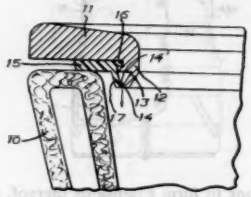
the resilient layer and shock absorbing layer being constructed and defined for coacting to absorb the impact energy transmitted through the outer shell and to release the stored energy after impact without any permanent deformation.

4,006,497

APPARATUSES FOR DISTRIBUTING FLUSHING LIQUID IN CLOSET PANS

Karl Allan Bonde Mollerstedt, Fjalkinge, Sweden, assignor to IFO AB, Bromolla, Sweden

Filed July 3, 1975, Ser. No. 592,794
Claims priority, application Sweden, July 4, 1974, 7408810
Int. Cl.² A47K 17/00
U.S. Cl. 4—1 **4 Claims**



1. An apparatus for distributing flushing liquid in a closet pan, comprising a separate member extending along at least the greater part of the upper edge of said closet pan and having a longitudinal channel with a row of openings which are directed towards the inner wall of said closet pan, said channel being connected to a supply of flushing liquid, a valve means between said supply of flushing liquid and said channel, said channel being defined by a wall of elastic material, said wall having a slot along said row of openings for the discharge of flushing liquid, said slot being closed in the normal position because of the inherent elasticity of the material but permitting the insertion of a tool which may be pulled along the entire length of said slot for cleaning said channel and said openings.

4,006,498

ADAPTER FOR BATHTUB DRAIN

Casper Cuschera, 31650 Medinah St., Hayward, Calif. 94543

Filed Sept. 2, 1975, Ser. No. 609,747
Int. Cl.² A47K 1/14; F16B 2/14
U.S. Cl. 4—191 **4 Claims**

1. An adapter for securing a valve device in a drain, comprising a cylindrical member adapted to be disposed in said drain, said cylindrical member including an exterior surface portion tapering inwardly and upwardly; an annular wedge disposed about said cylindrical member; drive means secured to said adapter and variably spaced with respect to said cylindrical member to drive said wedge to engage said tapered surface portion and the interior surface of said drain; and securance means for securing a valve device to said adapter, said cylindrical member including a central bore having an internally theaded portion, and said drive means including a tubular member provided with external threads adapted to be received in said central bore, said tubular member including a flange extending radially from the upper end thereof and beyond said cylindrical member for engaging and driving said

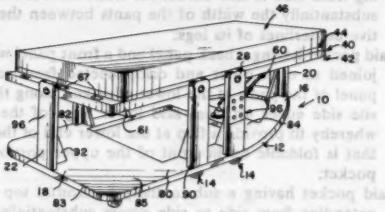
wedge in an axial direction into engagement with said tapered surface portion and said interior surface of said drain.

4,006,499

HOSPITAL BED

Claude A. Young, 126 Kensington, LaGrange, Ill. 60525

Filed July 21, 1975, Ser. No. 597,422
Int. Cl.² A61G 7/10
U.S. Cl. 5—62 **3 Claims**



1. A hospital bed comprising:

a bed underframe defining head and foot ends at the respective ends of same,

a mattress support frame disposed above the bed underframe and defining head and foot ends at the respective ends of same overlying the respective head and foot ends of said underframe,

said bed underframe including a head end pedestal adjacent the head end of said support frame, a foot end pedestal adjacent the foot end of said support frame, a first pair of side pedestals disposed one on either side of said support frame adjacent the midportion of the length of same, and a second pair of side pedestals disposed one on either side of said support frame intermediate said foot end of said support frame and the respective side pedestals of said first pair of pedestals,

first means for releasably connecting said support frame to said first pair of side pedestals for pivotal movement with respect thereto about aligned horizontal axes,

second means for releasably connecting said support frame to said first pair of side pedestals for pivotal movement with respect thereto about aligned horizontal axes,

third means for releasably connecting said support frame to said second pair of side pedestals for pivotal movement with respect thereto about aligned horizontal axes,

means for selectively operating the respective connecting means to the exclusion of the remaining connecting

means for conditioning said support frame for said pivotal movement about said axes of pedestals of the selected connecting means,

and power means operatively interposed between said underframe and said support frame for pivoting said support frame about the pivotal axes for which said support frame has been conditioned

and power means comprising:

actuating means operably connected to said support frame between said head end of same and said axes of said first pair of side pedestals, and to one side of said axes of said head and foot pedestals for pivoting said support frame about the pivotal axes for which said support frame has been conditioned,

and means for actuating said actuating means,

said first, second and third releasable connecting means each comprising:

a pair of opposed pin elements,

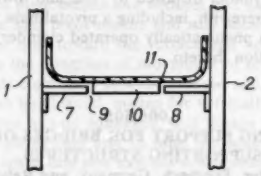
and means for moving said pin elements between operative positions connecting said support frame to the respective pedestals and inoperative positions freeing said support frame for up and down movement relative thereto.

4,006,500

STRETCHER HOLDER DEVICE FOR AMBULANCES

Andre Bonifay, 14 Bvd d'Athenes, Marseille 13001, France

Filed Mar. 13, 1975, Ser. No. 557,951
Int. Cl.² A61G 1/00
U.S. Cl. 5—82 R **1 Claim**



1. A stretcher and holder assembly comprising:

i. a frame including four parallel uprights,

ii. a respective plurality of parallel longitudinal crosspieces connecting each pair of said uprights at each of the sides of the frame,

iii. a respective plurality of parallel transverse crosspieces connecting each pair of said uprights at each of the two ends of the frame,

iv. a plurality of pairs of brackets disposed in vertical spaced relationship with one bracket of each pair secured on the pair of uprights at a respective side of the frame, the brackets of each pair being in the same plane and defining between them a longitudinal gap, said brackets being releasably secured on the respective uprights and adjustable along said uprights,

v. means for securing the ends of the uprights to the roof and floor of an ambulance, and

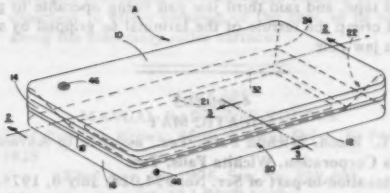
vi. at least one stretcher in the form of an elongated trough of rigid material, said stretcher including a longitudinal partition upstanding centrally for a part of its length to define in the stretcher trough a pair of zones to receive the legs, said stretcher including a longitudinal base member narrower than the trough width projecting downwardly from the trough along the entire length of the trough centrally thereof and serving to stiffen the trough, said stretcher being supported on a respective pair of said brackets with its longitudinal base member disposed in said longitudinal gap.

4,006,501

WATER BED MATTRESS

Raymond M. Phillips, 305 Poquito Lane, Topanga, Calif. 90290

Filed May 27, 1975, Ser. No. 581,262
Int. Cl.² A47C 27/08
U.S. Cl. 5—371 **20 Claims**



1. A water bed mattress comprising

a. an upper sheet having a peripheral end margin,

b. a lower sheet having a peripheral end margin and being in spaced apart relationship to said upper sheet,

c. a peripheral inner wall extending between and secured in operative relationship to said upper and lower sheets and forming a water chamber between said inner wall and upper and lower sheets,

d. said inner wall being inclined so that it extends in proximate relationship to the peripheral end margin of said upper sheet to form said water chamber substantially continuous with the surface of said upper sheet so that substantially the entire upper sheet is supported by water in said water chamber, and said inner wall extending inwardly from the peripheral end margin of said lower sheet and being secured to said lower sheet inwardly of its peripheral end margin,

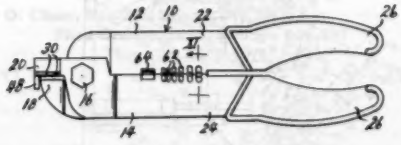
e. and a peripheral outer wall extending between said upper and lower sheets forming an air chamber bounded by said outer and said inner wall and said lower sheet so that said air chamber when filled with air provides continuous peripheral support by the air which is relatively less yieldable than the water in said water chamber, said water chamber having a periphery substantially contiguous with the periphery of said air chamber such that the air chamber can provide continuous peripheral support.

4,006,502

PACKAGING AND APPLICATOR TOOL FOR ELECTRICAL TERMINALS

Robert V. Strickland, 9021 Wedd, Overland Park, Kans. 66212

Filed Jan. 12, 1976, Ser. No. 648,300
Int. Cl.² B25F 1/00
U.S. Cl. 7—5.4 **7 Claims**



1. In combination with a terminal for electric wires having at one end a tubular ferrule adapted to be crimped tightly about an electric wire inserted therein, and an opposite end portion, and a package for such terminals consisting of a flexible tape to which said terminals are adhered in longitudinally spaced apart relation, a tool for apply said terminals comprising:

a. first, second and third pairs of relatively pivoted jaws

disposed in side-by-side relation with their operative edges extending transversely to their pivotal axes, and

b. operating means operable to close said jaw pairs in the same sequence, said first jaw pair being operable to grip said tape and said opposite end portion of one of said terminals therebetween, said second jaw pair including blade means operable to sever said tape intermediate the terminal so gripped and the next successive terminal on said tape, and said third jaw pair being operable to grip and crimp the ferrule of the terminal so gripped by said first jaw pair.

4,006,503

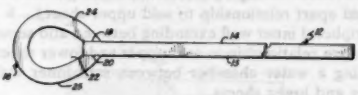
AQUATIC MAT

Robert L. Wood, Wichita Falls, Tex., assignor to Advanced Sports Corporation, Wichita Falls, Tex.

Continuation-in-part of Ser. No. 594,018, July 8, 1975, abandoned. This application Aug. 29, 1975, Ser. No. 609,049

Int. Cl.² A47C *27/08*

U.S. Cl. 9—13 **6 Claims**



1. An aquatic floatation mat capable of floating on either side in water and supporting one or more persons, comprising an elongted planar member and a headrest secured to and extending from an end portion of said planar member; said planar member and said headrest formed from closed cell, unicellular, plastic foam slab members, which are flexible, resilient, and non-water absorbent, and which have a surface coating of a tough, pliable, plastic material; said headrest slab member having ends thereof secured to the top and bottom of said end portion of said planar member, said headrest has a generally rounded shape with surfaces thereof extending above and below said planar member, and said headrest has an open transverse void.

4,006,504

AUTOMATIC HEEL AND SIDE LASTING SHOE MACHINES

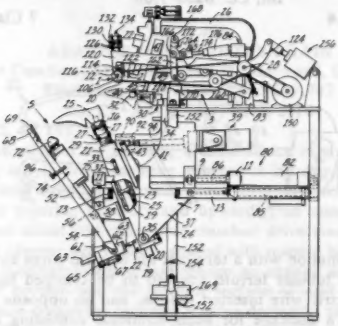
Ronald O. C. Gadd, Leicester, England, assignor to USM Corporation, Boston, Mass.

Filed Aug. 27, 1975, Ser. No. 608,327

Claims priority, application United Kingdom, Aug. 27, 1974, 37307/74

Int. Cl.² A43D *21/00*

U.S. Cl. 12—8.3 **4 Claims**



1. A shoe machine for automatically lasting side and heel portions of a shoe assembly, and machine comprising:

shoe assembly supporting means for supporting a shoe assembly, said shoe assembly comprising an upper and an insole assembled on a last;

a side lasting arrangement comprising a pair of side lasting rolls, each of said lasting rolls having a wiping element disposed helically about a circumferential portion of lasting roll;

said lasting rolls being supported by roll carrying means so that the axes about which said lasting rolls rotate extend at least substantially widthwise of any shoe assembly being operated upon;

means for rotating said lasting rolls in such directions that they operate to wipe marginal portions of said upper at opposite sides of a shoe assembly inwardly with respect to said insole of said shoe assembly so that the marginal portions of said upper and said insole may become secured together after an application of adhesive has been applied therebetween, the side lasting operation caused to progress along the opposite sides of said shoe assembly during relative movement in a direction extending lengthwise of said shoe assembly between said shoe supporting means and said lasting rolls;

means for providing relative movement between said shoe supporting means and said lasting rolls;

a heal seat lasting arrangement comprising a pair of wipers including means for effecting advancing and closing movements of said wipers to cause them to wipe marginal portions of said upper around said heel seat portion of said shoe assembly;

a shoe length measuring arrangement which permits positioning of said shoe assembly support means prior to the side lasting operation;

said shoe assembly supporting means being comprised of a slidably mounted carriage which permits movement in a direction extending lengthwise of said shoe assembly; and

said supporting means also comprising a pneumatically operated cylinder disposed to raise and lower said shoe assembly therewith, including a pivotal base on said support, and a pneumatically operated cylinder attached to impart motion thereto.

4,006,505

SLIDING SWING SUPPORT FOR BRIDGES OR SIMILAR SUPPORTING STRUCTURES

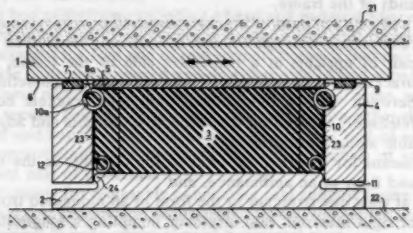
Waldemar Köster, Forsbach, Germany, and Reinhold Huber, Rorbas, Switzerland, assignors to Kober AG, Glarus Schweiz-Spielhof, Germany

Filed July 8, 1975, Ser. No. 594,060

Claims priority, application Germany, July 9, 1974, 2432898

Int. Cl.² E01D *19/06*

U.S. Cl. 14—16.1 **13 Claims**



1. A sliding swing bearing comprising upper and lower supporting members and an elastic cushion disposed therebetween, one of said supporting members being movable with respect to said cushion and the other one of said supporting members, said elastic cushion being at least in part enclosed by a peripheral wall casing and being provided with at least one insert of a material less resilient than said cushion spaced

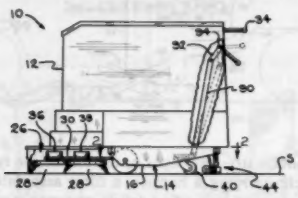
about the periphery thereof adjacent the movable support, said insert being partially embedded in said cushion and partially extending radially outward within said wall casing, said casing being formed with means for receiving said insert.

4,006,506

SURFACE CLEANING MACHINE WITH SQUEEGEE ASSEMBLY

Jack L. Burgoon, Toledo, Ohio, assignor to The Scott & Fetzer Company, Lakewood, Ohio

Filed Feb. 10, 1975, Ser. No. 548,566
Int. Cl.² A47L *11/30*
U.S. Cl. 15—50 R **3 Claims**



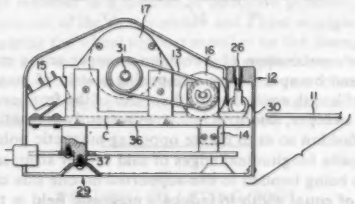
1. A machine for cleaning a surface comprising a frame, a pair of forward wheels carried by said frame for movably supporting the machine on the surface, scrubbing means carried by said machine forwardly of said wheels for scrubbing a strip of the surface when moved thereover, a squeegee assembly comprising a squeegee, a single arm connected to a center portion of said squeegee, means pivotally connecting said arm to said machine with the pivot point being centrally located between the sides of the machine and behind said scrubbing means, spring means having an end connected below said arm near said arm pivot means and another end connected to said arm between said pivot means and said squeegee for urging said squeegee only toward the surface and not in a direction transverse to the direction of movement of the machine, two spaced wheels connected to said squeegee and engagable with the surface to be cleaned, means for vertically adjusting said wheels relative to said squeegee, and means carried by said machine for lifting said arm to raise the squeegee above the surface only when said arm extends substantially straight back from said pivot means.

4,006,507

DEVICE FOR CONVEYING A CARD USED FOR A CARD READER

Shigeru Yoshida, Chichibu, Japan, assignor to Canon Kabushiki Kaisha, Tokyo and Canon Denshi Kabushiki Kaisha, both of, Japan

Filed June 11, 1975, Ser. No. 585,888
Claims priority, application Japan, June 14, 1974, 49-69247
Int. Cl.² F26B *13/28*
U.S. Cl. 15—102 **8 Claims**



1. A device for conveying a card comprising a card guiding path having a port for inserting the card and guiding the inserted card along said path;

means for reciprocatingly transferring the card along the card guiding path in said direction; and

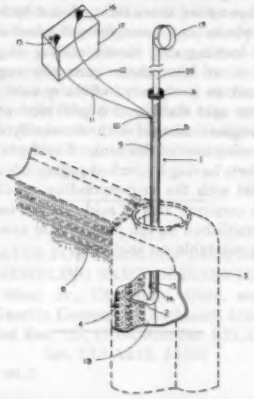
means for cleaning the card provided on the card guiding path at the side of the card inserting port thereof relative to the transfer means, the cleaning means comprising a roller having a cleaning member on at least a part of the surface of the roller, at least a part of the roller being contactable with the card, and controlling means for permitting the roller to be rotated in one direction by the card and preventing the roller from rotating in the other direction to effect cleaning of the card as its advances along the stationary roller surface.

4,006,508

MANUAL RADIATOR RODDER

Leonard Rudolph Brown, 8509 Whiteus Drive, El Paso, Tex. 79925

Filed Apr. 18, 1975, Ser. No. 569,403
Int. Cl.² B08B *9/00*
U.S. Cl. 15—104.05 **5 Claims**



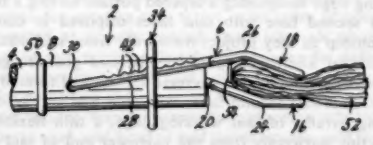
1. A device for cleaning the tubes of an automotive radiator comprising in combination: an elongated, hollow conduit, said conduit being provided at one end with coupling means for attaching a source of flushing fluid to said conduit and at the other end with means for coupling said conduit to the open end of an automotive radiator tube; flexible flat elongated means for reaming foreign material from said automotive radiator tubes by manual reciprocating motion, said flexible elongated means being disposed within said conduit and adapted for said reciprocating movement through said conduit and into a heat exchanger tube when said conduit is coupled therewith.

4,006,509

MOP HOLDER

Erin O. Chase, Box 266, Seneca, Mo. 64865

Filed Oct. 28, 1975, Ser. No. 626,247
Int. Cl.² A47L *13/253*
U.S. Cl. 15—150 **5 Claims**



1. A mop holder comprising:

a. an elongated handle staff,

b. a fixed jaw fixed to the lower end of said staff with its operative surface facing transversely of said staff,

c. a movable jaw pivoted to said staff on an axis transverse to said staff and spaced upwardly from said fixed jaw, the operative surface of said pivoted jaw facing said fixed jaw and being movable toward and away from said fixed jaw, said pivoted jaw including a pair of parallel arms extending upwardly from the operative portion thereof respectively along transversely opposite sides of said staff, the upper ends of said arms being coaxially pivoted to said staff on an axis transverse to said staff, whereby pivotal movement of said arms toward parallelism with the staff moves said jaws relatively closer together to clamp a mophead therebetween, and

operating means carried by said staff and operable to move said jaws closer together and to lock said jaws releasably at variable spacings therebetween, whereby mopheads of variable bulk and thickness may be clamped therebetween, said operating means comprising a closed locking ring encircling said staff and the arms of said pivoted jaw, whereby downward movement of said locking ring along said staff pivots said arms toward parallelism with said staff, said locking ring having sliding engagement with said staff at at least three generally regularly spaced points about its periphery, whereby said ring is guided relatively to said staff, and is provided at diametrically opposite regions thereof with outwardly offset portions each enclosing one of the arms of said pivoted jaw, each of said offsets having a reach engaging the associated arm and coaxial with the corresponding reach of the other offset, the common axis of said reaches being parallel to a plane established be the axes of said arms, said locking ring being rotatable on said staff.

4,006,510

SQUEEGEE

Barnabé Teixeira Soares, Sao Paulo, Brazil, assignor to Industrias Soares S/A. Borrachas e Metais, Sao Paulo, Brazil

Filed Aug. 25, 1975, Ser. No. 607,899
Claims priority, application Brazil, Aug. 26, 1974, 7064
Int. Cl.² B60S *1/04*
U.S. Cl. 15—245 **2 Claims**

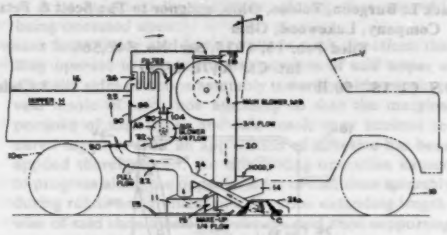
1. A squeegee comprising a thin, elongated rigid plate, a rubber-like coating completely enclosing said rigid plate having the same general shape as said rigid plate, said rubber-like coating forming a projection from one edge of said rigid plate and said projection forming a flexible working edge, said working edge comprising a tapered portion having a first face and a second face with said faces disposed in converging relationship as they project outwardly from said plate and a plurality of alternating parallel ribs and grooves generally rectangularly shaped in transverse section and formed in each of said first and second faces with said ribs and grooves extending parallel of said working edge, a thin flexible blade projecting outwardly from the narrower end of said tapered portion, the opposite surfaces of said blade extending outwardly from said tapered portion being disposed in parallel relation, and handle means connected to said rubber coating and said rigid plate.

4,006,511

SWEEPER WITH RECIRCULATION HOOD AND INDEPENDENT FILTER SYSTEM

Gregory J. Larsen, Claremont, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Feb. 9, 1976, Ser. No. 647,485
Int. Cl.² E01H *1/08*
U.S. Cl. 15—300 A **16 Claims**



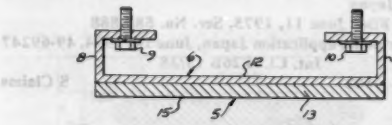
1. In a mobile street sweeper or the like of the type comprising a vehicle carrying a hopper, a filter associated with said hopper for separating out fine debris, sweeper means comprising a debris pickup hood having surface engaging flaps, blower means for withdrawing air from the hopper and delivering air to the hood, and an air return line for directing air from the hood back to the hopper, the improvement wherein said blower means comprises a main blower and a separate, auxiliary blower; a main blower inlet line connected to said hopper, a main blower delivery line connected to said hood; said fine debris filter having an inlet for receiving dusty air from said hopper and an outlet for filtered air connected to the inlet of said auxiliary blower, said auxiliary blower discharging filtered air to the atmosphere; the majority of the air flowing through said air return line from said hood coming from said main blower, said auxiliary blower inducing the remainder of the air flowing in said air return line which remainder corresponds to a flow of atmospheric air entering said sweeper means at the swept surface.

4,006,512

MAGNETIC BUMPER AND PICKUP DEVICE

Saul S. Saulson, 31477 Lost Hollow Lane, Birmingham, Mich. 48010

Continuation of Ser. No. 487,856, July 12, 1974, abandoned. This application Jan. 7, 1976, Ser. No. 647,075
Int. Cl.² A47L *9/00*
U.S. Cl. 15—339 **2 Claims**



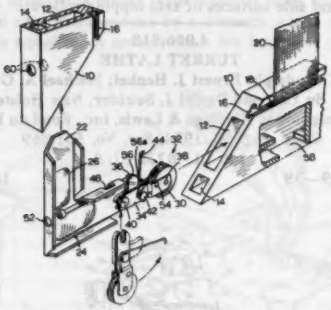
1. The combination of a vacuum sweeper and a magnetic pickup and bumper device comprising a strip of magnetized rubber of length equivalent to the width of the front end of the vacuum sweeper, said strip being permanently magnetized in a bipolar fashion so as to create opposing magnetic poles along the opposite longitudinal edges of said rubber strip; said rubber strip being bonded to and supported on one side of a strip of steel of equal width to induce a magnetic field in the steel strip; said steel strip having a U-shaped mounting bracket formed at each end so that the length of the bonded surface of the steel strip is equivalent to the length of said rubber strip; said steel strip being fastened to the lower forward end of the vacuum sweeper by said mounting brackets so as to create a space between the backside of said steel strip and the forward

end of said sweeper; said rubber strip facing outwardly from said sweeper with its length being parallel, and its width perpendicular to the surface of the floor supporting said vacuum sweeper whereby the rubberized strip precedes the sweeper upon forward motion of the sweeper to act as a resilient bumper and ferrous objects attracted to the device will become lodged on the backside of the steel strip with their elongate axes vertically aligned, out of the pickup range of the sweeper.

4,006,513
RUNNER WHEEL SUPPORT

Hermann Friedrich Offterdinger, 602 Galway Drive, Burlington, Ontario, Canada

Filed June 25, 1975, Ser. No. 590,199
Int. Cl.² E05D 13/02
U.S. Cl. 16—99 9 Claims



1. A runner wheel support for sliding doors, windows and the like of the type having a frame formed by connected hollow sections, the support comprising:

a support body adapted to be inserted in a frame hollow section for retention therein;

a removable wheel support member carrying a runner wheel and pivoted to the support body by a disengageable pivot for movement between stored, operative and removal positions; in which stored position the support body and wheel support member pivoted thereon can be mounted in a hollow frame section; in which operative position the wheel can engage a track on which it runs; and in which removal position the wheel support member can be disengaged from the said pivot and thereby from the support body;

a cam member movable with the wheel support member about the said pivot;

a first cam-engaging means on the support body engaging the cam member to releasably retain the wheel support member in the said stored position; and

a second cam-engaging means on the support body engaging the cam member to releasably retain the wheel support member in a lowermost operative position;

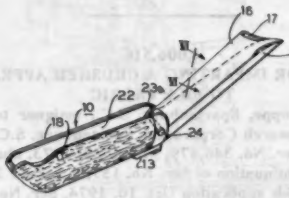
engagement of the cam member and a cam-engaging means retaining the wheel support member on the disengageable pivot and movement of the wheel support member to the said removal position disengaging the cam member and the cam engaging means to permit disengagement of the wheel support member from the pivot.

4,006,514
FOLDING FILLETING TOOL

Melvin C. Penman, 560 Heim Road, Getzville, N.Y. 14068

Filed July 10, 1975, Ser. No. 594,587
Int. Cl.² A22C 25/00
U.S. Cl. 17—68 5 Claims

1. A portable, foldable tool for filleting fish comprising a handle, a dual purpose blade, sharpened to a cutting edge along one longitudinal edge and a shield for said blade, said shield being nestable in said handle, said blade being nestable in said shield having the other longitudinal edge exposed when in nested position, said blade and said shield being mounted on said handle about a transverse axis for independent pivotal movement from a position nested within said handle to operative position; wherein said other longitudinal edge is tapered to a scraping edge, blunt relative to said cutting edge, said

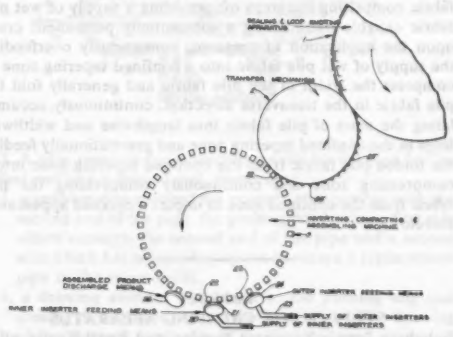


shield completely covering said cutting edge in nested position with said blade and being of generally U-shaped in transverse cross section, the web of the U being closed over its entire length having a concave curvature at its free end having sharp edges at the junction with their lateral surfaces to serve as shears to remove the fillet from the rib cage merging with the free end of said blade when said blade is nested in said shield to form a combined end curvature substantially conforming to the curvature of the rib cage of a fish.

4,006,515
APPARATUS FOR FORMING TAMPONS AND ASSEMBLING SAME IN INSERTERS

John George Mast, Jr., Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 10, 1974, Ser. No. 531,222
Int. Cl.² A61L 15/00
U.S. Cl. 19—144.5 56 Claims



1. In apparatus for inverting aggregate containing tampon sacks having withdrawal strings at one end to form them into rosette shape, compacting the inverted sacks into cylindrical configuration, and assembling the compacted sacks in inserters having inner and outer parts, a rotatable assembly turret, drive means for rotating said turret, a plurality of operating heads located at equally spaced apart intervals about the periphery of said turret, a first feeding means for delivering inner inserter parts to each said head and a second feeding means for delivering outer inserter parts to each said head as said turret rotates, transfer means for delivering tubular tampon sacks to each said head as said turret rotates, said transfer means including string gripping means for presenting the tampon sacks to said heads with their withdrawal strings extended, grabbing means associated with each said head for engaging the extended withdrawal strings of the tampon sacks

and drawing the tampon sacks into the heads by means of their strings, each said head including inverting means for forming the tampon sacks into rosette shape, compression means for compacting the inverted sacks into essentially cylindrical tampons, and means for assembling the compacted tampons with said inner and outer inserter parts to form an assembled tampon structure, and means for discharging the assembled tampon structures from said heads during rotation of said turret.

4,006,516

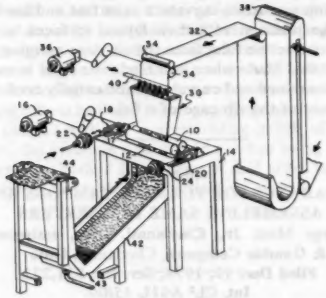
PROCESS FOR IMPARTING A CRUSHED APPEARANCE TO PILE FABRIC

Charles R. Ruppe, Spartanburg, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Division of Ser. No. 346,679, March 30, 1973, abandoned, which is a continuation of Ser. No. 157,965, June 29, 1971, abandoned. This application Oct. 10, 1974, Ser. No. 513,626

Int. Cl.² D06C *23/04*

U.S. Cl. 26—2 R **1 Claim**



1. A process for imparting a crushed appearance to pile fabric comprising the steps of: providing a supply of wet pile fabric capable of retaining a substantially permanent crush upon the application of pressure, continuously overfeeding the supply of wet pile fabric into a confined tapering zone to compress the width of the pile fabric and generally fold the pile fabric in the transverse direction, continuously accumulating the mass of pile fabric into lengthwise and widthwise folds in the confined tapering zone and gravitationally feeding the folded pile fabric from the confined tapering zone into a compressing zone and continuously compressing the pile fabric from the confined zone to impart a crushed appearance thereto.

4,006,517

STUFFER BOX CRIMPING APPARATUS

Nobuharu Izawa; Yasumasa Nomizo, and Kenji Kanda, all of Matsuyama, Japan, assignors to Teijin Limited, Osaka, Japan

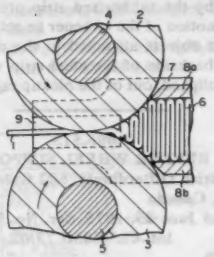
Filed Feb. 3, 1976, Ser. No. 654,980

Claims priority, application Japan, Feb. 10, 1975, 50-16222

Int. Cl.² D02G *1/12*

U.S. Cl. 28—1.6 **17 Claims**

1. A stuffer box crimping apparatus for a thermoplastic filamentary tow comprising a pair of a cylindrical parallel nipping rollers forming a nip therebetween, a stuffer box adjacent said nipping rollers and receiving said tow from said nip, and a pair of cheek members arranged in contact with outer lateral side surfaces of said nipping rollers at the nip portion of said nipping rollers, said cheek member comprising a base layer consisting of a hard material and a soft surface layer which consists of soft material and has a thickness of 0.2mm or less, said soft surface layer being supported on at least a surface portion of said base layer in contact with the outer lateral side surfaces of said nipping rollers, said surface



portion of said base layer being substantially parallel to said outer lateral side surfaces of said nipping rollers.

4,006,518

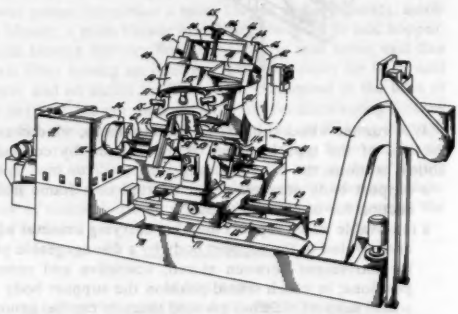
TURRET LATHE

Richard C. Rudolph; Ernest J. Henkel; Michael A. Glandt, all of Fond du Lac, and Daniel J. Seichter, New Holstein, all of Wis., assignors to Giddings & Lewis, Inc., Fond du Lac, Wis.

Filed Aug. 30, 1974, Ser. No. 501,869

Int. Cl.² B23B *3/18*

U.S. Cl. 29—39 **18 Claims**



1. In a turret lathe for machining a workpiece by engaging the workpiece with tools while rotating said workpiece about a horizontal spindle axis, the combination comprising, a bed, a pair of bed ways supported on the bed in a horizontal plane, said bed ways being parallel to the spindle axis but offset therefrom, a carriage mounted for rectilinear translation on the bed ways, the carriage having a pair of parallel slide ways defining a slant plane parallel to the spindle axis but inclined with respect to the plane of the bed ways, a slide mounted for rectilinear translation on the slide ways, a tool holding turret on the slide having an axis intersecting the spindle axis but skewed with respect thereto, the tool holding turret including means for compensating for the skew angle of the turret axis to present a selected tool to the workpiece in a non-skewed attitude.

4,006,519

APPARATUS FOR MAKING TAP CONNECTIONS TO MULTI-CONDUCTOR CABLE

Robert Alvin Long, and William Boderick Over, both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 19, 1975, Ser. No. 633,192

Int. Cl.² H01R *43/04*

U.S. Cl. 29—749 **11 Claims**

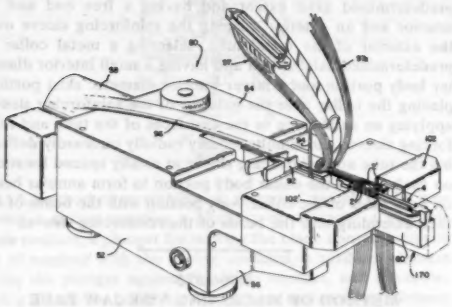
1. Apparatus for inserting intermediate portions of a plurality of pairs of wires into the wire-receiving portions of electrical contact terminals, said terminals being contained in an

electrical connector and being arranged in two aligned parallel rows with said wire-receiving portions being oppositely directed whereby a pair of wires can be electrically connected to corresponding aligned terminals in said rows by locating said wires on opposite sides of said connector and moving said wires laterally of their axes, towards said connector and into the wire receiving portions of said aligned terminals, said apparatus comprising:

frame means,

connector supporting means, said connector supporting means projecting cantilever fashion from said frame means for a distance which is substantially equal to twice the length of one of said rows, said connector supporting means having connector supporting surface portions for supporting said connector in an orientation with said rows extending in the projecting direction of said supporting means,

first and second wire inserting rams on two opposite sides of said supporting means, said inserting rams being spaced from said frame means by a distance which is substantially equal to, or greater than, the length of one of said



rows, said inserting rams being reciprocable towards and away from a connector supported on said supporting means,

positioning means for providing relative movement of said supporting means and said rams with respect to each other in directions extending parallel to the projecting direction of said supporting means so that said rams can be located selectively in alignment with the wire-receiving portions of all of the aligned terminals in said rows, and

wire stop means disposed proximate to said inserting rams for locating a pair of said wires on opposite sides of said supporting means and in alignment with said inserting rams whereby,

upon positioning said connector on said supporting surface portions of said supporting means, repetitively actuating said positioning means to locate said rams in alignment with two predetermined aligned terminals in said rows, repetitively locating a pair of wires on opposite sides of said supporting means and against said wire stops, and repetitively reciprocating said inserting rams, said pairs of wires are inserted into the wire receiving portions of the aligned terminals in said rows.

4,006,520

MACHINE FOR CONNECTING WORKPIECES, ESPECIALLY PIPE BEND SEGMENTS OR THE LIKE

Erich Wachter, Zurich, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

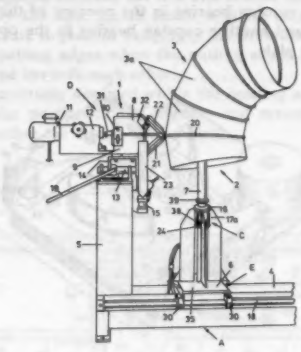
Filed Jan. 12, 1976, Ser. No. 648,562

Claims priority, application Switzerland, Jan. 20, 1975, 647/75

Int. Cl.² B21D *39/04*

U.S. Cl. 29—243.52 19 Claims

1. A machine for connecting pipe bend segments, comprising a table for supporting pipe bend segments to be interconnected, means for rotatably mounting the table, a support, a working head mounted at said support for cooperation with said rotatable table, said working head being provided with two rolls for connecting the pipe bend segments, adjustment



means for changing the relative spacing between the working head and the rotatable table, and means for elastically supporting the rotatable table in elevational position.

4,006,521

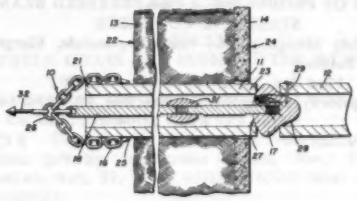
PIPE REMOVER

John A. Pedone, 19 Commonwealth Ave., Shrewsbury, Mass. 01545

Filed June 2, 1975, Ser. No. 583,049

Int. Cl.² B21D *39/00;* B23P *19/04*

U.S. Cl. 29—282 6 Claims



1. A pipe remover for extracting an old buried pipe having a first end and a second end, comprising

a. a pushing dog adapted for contact engagement with the second end of the pipe, the pushing dog having a first side which contacts the second end of the pipe and a second side which has a fastening means to secure a replacement pipe to the second side,

b. a drawing element connected to the pushing dog and passing through the pipe to the first end to allow drawing of the element outwardly of the first end, and

c. a grasping dog which is adapted to securely engage the first end of the pipe for axial pulling of the pipe outwardly of the first end, so that the pipe is pulled at its first end and pushed at its second end.

4,006,522

TWO PIECE SHEET METAL CAPSTAN HOUSING ASSEMBLY METHOD

Donald J. Dattilo, Mount Prospect, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 469,203, May 13, 1974, Pat. No. 3,921,881. This application Nov. 20, 1975, Ser. No. 633,739

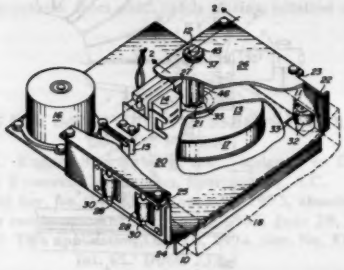
Int. Cl.² B23Q *17/18*

U.S. Cl. 29—407 4 Claims

1. A method of constructing a cartridge receiving chamber and a capstan housing assembly for a tape player device of the type using an exchangeable cartridge, comprising the steps of:

forming a cartridge support member and a cover plate of sheet material with openings in the member and the plate adapted to receive capstan bearings,

seating one capstan bearing in the opening of the support member and another capstan bearing in the opening of the cover plate,



aligning the support member and the cover plate with respect to each other by inserting a shaft through each of the seated bearings perpendicular to the support member, and

fastening the cover plate to the support member to hold the capstan bearings in alignment with the cartridge receiving chamber formed by the support member and the cover plate.

4,006,523

METHOD OF PRODUCING A PRE-STRESSED BEAM OF STEEL AND CONCRETE

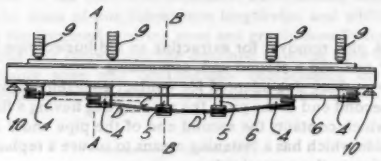
Jean-Baptiste Mauquoy, 264 route Provinciale, Bierges lez Wavre, Belgium

Filed Jan. 21, 1975, Ser. No. 542,702

Claims priority, application Belgium, Jan. 22, 1974, 140078

Int. Cl.² B28B *23/04*

U.S. Cl. 29—452 **5 Claims**



1. A method of producing a prestressed beam of steel having a flange, which comprises the steps of: securing to the flange a plurality of spaced apart transmission elements; attaching at least one tensioning wire to the transmission elements, each wire being attached to two of the transmission elements so that the respective wires extend at predetermined distances from the flange; tensioning the at least one wire so as to apply to the beam via the transmission elements in positions corresponding to each transmission element, a bending moment which is oppositely directed to that of the operating loads to be applied to the beam, and applying a stress to the beam during the tensioning of the at least one wire which substantially counteracts the bending moments, in order to create solely compressive forces in the beam; encasing the at least one wire, the transmission elements and the flange in concrete while maintaining the tensioning; and after the concrete has set, freeing the beam of the stresses counteracting the bending moments due to the tensioning of the at least one wire to allow the beam of steel to bend.

4,006,524

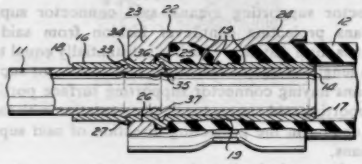
METHOD OF MAKING A HOSE COUPLING

Irving G. Frank, Euclid, Ohio, assignor to The Weatherhead Company, Cleveland, Ohio

Division of Ser. No. 478,582, June 12, 1974, Pat. No. 3,924,883. This application Aug. 4, 1975, Ser. No. 601,543

Int. Cl.² B21D *39/00*; B23P *19/04*

U.S. Cl. 29—455 R **3 Claims**



1. A method of making a hose coupling comprising the steps of selecting a length of metal tube having a free end and an interior and an exterior, selecting a metal reinforcing sleeve of predetermined axial extent and having a free end and an interior and an exterior, placing the reinforcing sleeve over the exterior of the metal tube, selecting a metal collar of predetermined axial extent and having a small interior diameter body portion and a larger interior diameter skirt portion, placing the collar over the exterior of the reinforcing sleeve, applying an axial force to the end faces of the tube and reinforcing sleeve, and simultaneously radially outwardly deflecting the tube and reinforcing sleeve at axially spaced locations on each side of the collar body portion to form annular beads on both sides of the collar body portion with the beads of the tube extending into the beads of the reinforcing sleeve.

4,006,525

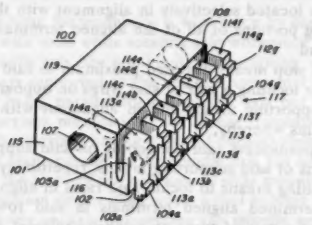
METHOD OF MACHINING VISE JAW FACE

Douglas J. Hennenfent, Minneapolis; Robert A. Johnson, Minnetonka, and Raymond Eino Jutila, Wayzata, all of Minn., assignors to Control Data Corporation, Minneapolis, Minn.

Division of Ser. No. 526,555, Nov. 25, 1974, Pat. No. 3,951,395. This application Apr. 8, 1976, Ser. No. 675,092

Int. Cl.² B23P *13/04*

U.S. Cl. 29—558 **4 Claims**



1. A method of manufacturing an improved face for a jaw of a vise intended to apply even pressure along a flat surface, including the steps of

a. machining first and second opposite exterior sides in a block of refractory material;

b. machining a gripping face intersecting both the first and second sides of the block along first and second gripping face straight lines of intersection;

c. cutting a plurality of substantially identical and parallel first slots cutting the entire breadth of the gripping face at equally spaced intervals and extending part way through the block;

d. cutting a second slot across the entire breadth of the first side along a line parallel to the first gripping face line of intersection, extending part way through the block

toward the second side, and intersecting each first slot; and

e. machining the gripping face adjacent each slot to be tangent at at least one point to a flat plane having a predetermined location adjacent the gripping face.

4,006,526

ELECTRIC COMMUTATOR-SWITCH AND METHOD FOR ASSEMBLING IT

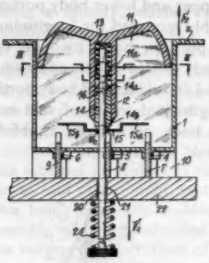
Jacques Marie Vidalin, Bordeaux, France, assignor to Phoebe S. A., Fribourg, Switzerland

Filed May 27, 1975, Ser. No. 580,581

Claims priority, application France, May 27, 1974, 74.19451

Int. Cl.³ H01H *11/00*

U.S. Cl. 29—622 **2 Claims**



1. A method of assembling an electrical switch of the type having a casing carrying a plurality of contacts, a movable blade contact, a plunger for moving the blade contact into and out of contact with the casing contacts, a resilient element urging the plunger against the blade contact, and a tumbler having means for receiving the plunger and resilient element and for moving the plunger and resilient element therewith, said method comprising the steps of:

providing a work base with a pin projecting upwardly therefrom;

inserting said casing over said pin with said pin protruding through a hole in the bottom of said casing;

inserting said blade contact over said pin with said pin protruding through a hole in said blade contact;

inserting said plunger over said pin with said pin protruding through an axial hole in said plunger;

inserting said resilient element over said pin with said pin protruding into an axial hole in said resilient element;

inserting said tumbler over said plunger and resilient element with said plunger and resilient element received in said receiving means; and

removing the assembled casing, blade contact, plunger, resilient element and tumbler from said pin.

4,006,527

APPARATUS FOR SALVAGING SCRAP METAL

Eugene W. Sivachenko, 6851 Waverly Manner, Redding, Calif. 96001

Division of Ser. No. 464,596, April 25, 1974, Pat. No. 3,908,493. This application June 27, 1975, Ser. No. 590,978

Int. Cl.³ B23D *27/00*

U.S. Cl. 30—241 **4 Claims**

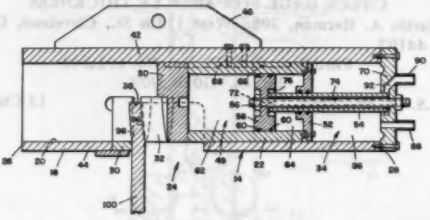
1. Apparatus for the infield salvage of large metal structures such as vessels or railroad cars and for disintegrating such structures into relatively small pieces of scrap metal, the apparatus comprising:

a tubular outer housing including first means defining a first, concave cutting edge;

a plunger having a tubular portion, the plunger being movably disposed within the housing for movement along an interior of the housing, the plunger including second means defining a second, convex cutting edge cooperating with the first means for shearing scrap metal pieces having an arcuate outline when a portion of the structure is disposed between the first and second means;

whereby the first means forms a stable support for the structure to prevent wedging of the structure, the piece or the cutting edges when the cutting edges are forceably moved towards each other;

a disc coaxially disposed within the housing and within the tubular portion of the plunger and means stationarily mounting the disc to the housing;



means sealing the tubular plunger portion from the housing interior to thereby form sealed first and second hollow chambers on respective sides of the disc;

means for alternatively subjecting the chambers to a pressurized fluid to thereby reciprocate the plunger relative to the housing and the disc in an axial direction so that the first means and the second means are moved towards and past each other for severing a portion of the structure disposed between the first and second means into small pieces of scrap metal.

4,006,528

PORTABLE GRASS AND BUSH CUTTER WITH BRAKE AND CLUTCH

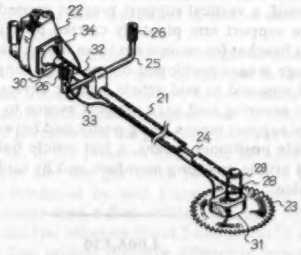
Kazunari Katsuya, Okayama, Japan, assignor to Kaaz Machinery Co. Ltd., Japan

Filed Nov. 5, 1975, Ser. No. 628,953

Claims priority, application Japan, Nov. 22, 1974, 49-134546; Nov. 22, 1974, 49-142516[U]; Mar. 29, 1975, 50-42149[U]

Int. Cl.³ B27G *19/02*

U.S. Cl. 30—276 **12 Claims**



1. A portable grass and bush cutter having a drive shaft, an engine and a rotary blade, bevel gear means for connecting said rotary blade to said drive shaft, means for supplying fuel to said engine, a centrifugal clutch for connecting said engine to said drive shaft, and friction brake means operable to quickly stop rotation of said rotary blade, means for carrying said grass and bush cutter in use and a control lever mounted in cooperation with said means for carrying the grass and bush cutter, two flexible wire means connected to said lever, one of said flexible wires being connected to said means for supplying

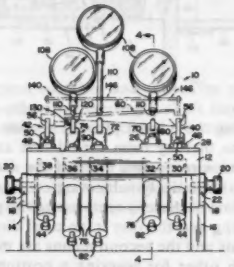
fuel to said engine, friction brake actuating means for actuating the brake, the other of said flexible wires being connected to the said friction brake actuating means, means for urging said lever into a first position in which the fuel supply to the engine is substantially shut off and in which said friction brake actuating means actuates said brake, said lever being moveable into operating position by the operator to permit fuel flow to the engine and to release the brake, said lever being automatically returnable to the first position upon release of the lever by the operator.

4,006,529

CHECK GAGE FOR ARTICLE THICKNESS

Martin A. Herman, 2085 West 114th St., Cleveland, Ohio 44102

Filed Sept. 8, 1975, Ser. No. 611,340
Int. Cl.² G01B 3/00
U.S. Cl. 33—174 L **13 Claims**



1. A gaging apparatus comprising

a support means including a base having a plurality of longitudinally spaced bores therein,

a pair of test article positioner means carried by said base in individual ones of said bores and having an axially movable section operatively protruding upwardly therefrom, an article engaging member operatively positioned on each of said sections, and means to limit axial movement of said sections toward said base to seat against said base to prepare the gage for article test action,

a gage support means including a cylindrical carrier section positioned in at least one of said bores and on a substantially vertical axis, a positioner pin in said carrier and axially movable therein and an article locater device operatively carried by said pin for movement on the axis thereof, a vertical support bracket carried by said pin, a gage support arm pivotally carried by said vertical support bracket for movement to an inoperative position and a gage means positioned on said gage support arm above and opposed to said article locater device, and

means securing said gage support means to said base, said gage support means being positioned between said pair of article positioner means, a test article being engaged by said article engaging members and by said article locater device.

4,006,530

APPARATUS FOR MEASURING THE DIAMETER OF A WELL BORE

Yves Nicolas, Versailles, France, assignor to Schlumberger Technology Corporation, New York, N.Y.

Continuation of Ser. No. 485,059, July 1, 1974, abandoned.
This application July 16, 1975, Ser. No. 596,492
Claims priority, application France, Apr. 9, 1974, 74.12370
Int. Cl.² E21B 47/08
U.S. Cl. 33—178 F **2 Claims**

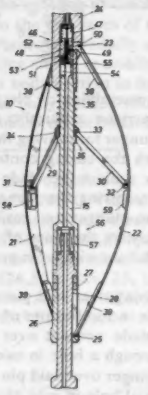
1. A well-calipering tool adapted for movement through a well bore and comprising:

a body having longitudinally-spaced upper and lower portions and adapted for suspension in a well bore;

at least three elongated bow springs circumferentially spaced in upright positions around said body with the mid-point of each of said bow springs being laterally disposed from an intermediate portion of said body situated between said upper and lower body portions;

first coupling means pivotally securing a first end of each of said bow springs to a first one of said upper and lower body portions for limiting said first spring ends to only pivotal movement in relation to said one body portion as said spring mid-points respectively move between a laterally-extended position and a retracted position adjacent to said intermediate body portion;

second coupling means cooperatively intercoupling the second end of each of said bow springs to each other for longitudinal movement together in relation to a second one of said upper and lower body portions and including a collar slidably mounted for longitudinal travel on said second body portion, means pivotally coupling said second spring ends to said collar, and stop means cooperatively arranged on said second body portion for limiting at least the longitudinal travel of said collar toward said intermediate body portion to establish said extended positions of said bow springs;



means cooperatively arranged for maintaining said spring mid-points equidistant from said intermediate body portion and including a coupling member slidably disposed on said body for longitudinal movement thereon between said first spring ends and said intermediate body portion, a corresponding number of rigid links arranged between said coupling member and about the mid-point of each of said bow springs, first pivot means pivotally intercoupling one end of each of said rigid links to about said mid-points of each of said bow springs, second pivot means pivotally interconnecting said coupling member to the other end of each of said rigid links, and biasing means normally urging said coupling member toward said intermediate body portion for coordinating the lateral movements of said bow springs and for imposing a progressively-increasing lateral force thereon as said bow springs move toward their respective extended positions;

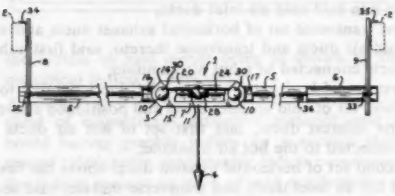
electrical transducer means secured to said body and having a selectively-variable electrical characteristic; and

transducer-actuating means coupled to at least one of said bow spring operable upon lateral movement of said spring mid-points for proportionally varying said electrical characteristic as a function of well bore diameter.

4,006,531
GUN SIGHT
Stanley J. Kwako, Heaton, N. Dak. 58450
Filed Sept. 15, 1975, Ser. No. 613,355
Int. Cl.² F41G *1/02, 1/52*
U.S. Cl. 33—261 **2 Claims**

1. An auxiliary lead-type gun sight adaptable for use universally with shotguns and rifles of the single-barrelled type and of the double-barrelled type disposed either vertically or horizontally, comprising a unitary, elastic cylindrical member adapted to be mounted around one barrel or two barrels and stock of guns and rifles at a suitable distance from the breech thereof, three adjacent upwardly projecting gun sights disposed and aligned circumferentially on the outer periphery of said cylindrical member, said gun sights when mounted on said barrel or barrels adapted to have the center sight project vertically at the midpoint between said barrel or barrels and the two side sights adapted to project at an outward upward angle with respect to said center sight, said cylindrical member and gun sights being integrally molded from an elastomeric material capable of being distended sufficiently to fit around each of the various configurations of said shotguns and rifles.

4,006,532
GAUGE FOR MEASURING VEHICLE FRAME ALIGNMENT
Ellis A. Hallman, Lebanon, Oreg., assignor to Kansas Jack, Inc., McPherson, Kans.
Filed Nov. 17, 1975, Ser. No. 632,562
Int. Cl.³ G01B *11/27*
U.S. Cl. 33—288 **6 Claims**



1. A self-aligning extensible gauge for measuring vehicle frame alignment comprising:

a. a body member having a longitudinally extending central portion and opposed laterally outwardly extending leg members thereon;

b. a plurality of bearing members carried by and longitudinally spaced on said central portion;

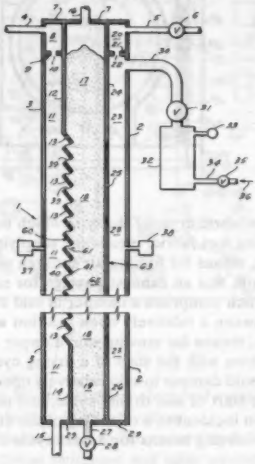
c. first and second elongate arms on opposite sides of said central portion and having inwardly facing surfaces movably engaging said bearing members, said arms extending longitudinally and having outer end portions in opposite directions from said body member, said arms each having outwardly facing surfaces;

d. guide members mounted on said leg members and having movable engagement with respective outer surfaces of said first and second arms and cooperating with said bearing members to maintain said arms movably mounted in parallel relationship, said leg members and guide members urging the respective arms laterally toward the bearing members;

e. means on outer end portions of each of the arms for engaging a vehicle frame to be straightened and supporting said arms and body member thereon; and

f. a sight member mounted on said body member.

4,006,533
TREATING GAS AND GRANULAR MATERIAL IN PANEL BED
Arthur M. Squires, 245 W. 104th St., New York, N.Y. 10025
Filed Aug. 28, 1974, Ser. No. 501,276
Int. Cl.² F26B *3/00*
U.S. Cl. 34—33 **3 Claims**



1. A method of contacting gas and granular material with each other to effect physical or chemical treatment of at least one of them, comprising:

a. arranging granular material having apertured outer walls in a bed having a plurality of transversely disposed upwardly spaced gas entry portions separated by interposed supporting members having outer and inner edges with respect to the bed wherein said gas entry portions have gas entry faces substantially contiguous with said outer edges and said bed having gas exit portions spaced from said inner edges;

b. forwardly flowing gas in a substantially continuing flow during said treatment through the gas entry portions of the granular material bed and outwardly from the gas exit portions to effect said treatment of one of said gas and granular material;

c. thereafter causing a transient flow of gas to move in the direction in reverse to the flow of said gas in (b); and

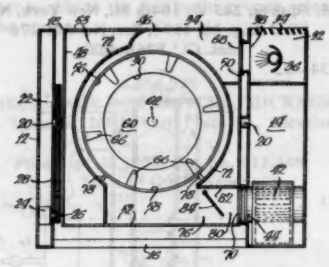
d. causing said transient reverse flow to produce first, a rise in the pressure difference at a given rate of rise between the gas exit portions and the gas entry portions and subsequently a fall in the pressure difference between the gas exit portions and the gas entry portions, said pressure difference produced by said transient reverse flow remaining greater than a first critical minimum difference for a time interval between about 5 and about 50 milliseconds, said first critical pressure difference being that at which a steady flow of gas in said reverse direction just produces a localized spill of granular material from the gas entry faces, and the pressure difference produced by said transient reverse flow peaking to a top value beyond a second critical minimum difference, which is the pressure difference at which a transient flow of gas in the reverse direction producing said pressure difference at said given rate of rise just initiates a body movement of the granular material supported by said members toward the gas entry faces to spill a portion of the granular material from the bed.

4,006,534

VARIABLE AIR SUPPLY FOR FABRIC DRYERS

Robert B. Coffman, Crystal Lake, Ill., assignor to Norman Dryer Co., Inc., Crystal Lake, Ill.

Filed Aug. 22, 1975, Ser. No. 607,017
Int. Cl.² F26B 21/12
U.S. Cl. 34—54 3 Claims



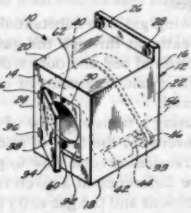
1. In a fabric dryer of the type which includes a tumbler for containing wet fabric, means for supplying heated air to said tumbler, means for forcing air through said tumbler in a confined path, and an exhaust passage for said air; the improvement which comprises a damper in said exhaust passage movable between a relatively open position and a flow restricting position, means for moving said damper to said flow restricting position with the start of a drying cycle of said dryer and moving said damper to said relatively open position an interval after the start of said drying cycle, and means responsive to a condition incident to a reloading of the dryer for enabling said damper moving means for a next cycle of operation.

4,006,535

APPARATUS AND METHOD FOR CONTROLLING CYCLES OF OPERATION OF A DRYER

James K. Nelson, Marion, Ill., assignor to Fedders Corporation, Edison, N.J.

Filed Nov. 5, 1975, Ser. No. 628,922
Int. Cl.² F26B 11/04
U.S. Cl. 34—55 8 Claims



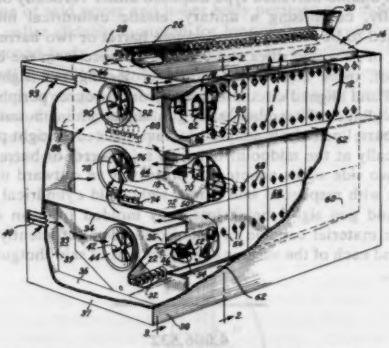
1. A dryer comprising a cabinet; a rotatable drum within said cabinet; a door on said cabinet operable between an open position to permit access to said drum and a closed position; motor means for rotating said drum; cycle changing means for changing the cycle of operation of said dryer between first and second cycles; and control means for operating said cycle changing means and for deenergizing said motor as said dryer is switched from one to another cycle of operation, said control means comprising a switch normally residing in an open state and movable to a closed state in response to movement of said door to the closed position to connect said motor means in circuit with a source of energy, an actuating shaft, operating means on said actuating shaft connected to said cycle changing means for changing the cycle of operation of said dryer between said first and said second cycles in response to movement of said shaft between first and second positions, and mounting means for mounting said shaft adjacent said door so that said shaft is accessible only when said door is in the open position, whereby movement of said door to said open position permits access to said actuating shaft and causes movement of said switch to said open position to simultaneously deenergize said motor means.

4,006,536

CONCURRENT-COUNTERCURRENT FLOW GRAIN DRYER WITH AIR RECYCLING MEANS

Elmo R. Meiners, Anchor, Ill., assignor to M & W Gear Company, Gibson City, Ill.

Filed Jan. 22, 1976, Ser. No. 651,601
Int. Cl.² F26B 17/12
U.S. Cl. 34—169 6 Claims



1. In a continuous flow grain dryer of the type having an enclosed bin with a wet grain inlet at the top of the bin, grain outlets at the bottom of the bin, means for providing wet grain at the inlet, means for removing grain at the outlets, the improved concurrent counterflow structure for drying said grain comprising, in combination:

a lower set of horizontal cold air inlet ducts extending the length of said bin and joined to means for directing cold air into said cold air inlet ducts;

a first transverse set of horizontal exhaust ducts above the cold air ducts and transverse thereto, said first exhaust ducts connected to a hot air manifold;

a first set of horizontal hot air inlet ducts parallel to the lower set of cold air inlet ducts and positioned above the first exhaust ducts, said first set of hot air ducts also connected to the hot air manifold;

a second set of horizontal exhaust ducts above the first set of hot air inlet ducts and transverse thereto, said second set providing exhaust from the bin to the atmosphere;

a second set of horizontal hot air inlet ducts parallel to the lower cold air inlet ducts and positioned above the second exhaust ducts, said second hot air inlet ducts also connected to the hot air manifold; and

means for providing hot air flow to the hot air manifold for subsequent flow into said hot air inlet ducts whereby, air from said first set of exhaust ducts is combined with the hot air inlet flow to said hot air inlet ducts.

4,006,537

EDUCATIONAL DEVICE FOR LEARNING ROTARY ENGINE FUNDAMENTALS

Charles G. Valentine, Stamford, Conn., assignor to Xerox Corporation, Stamford, Conn.

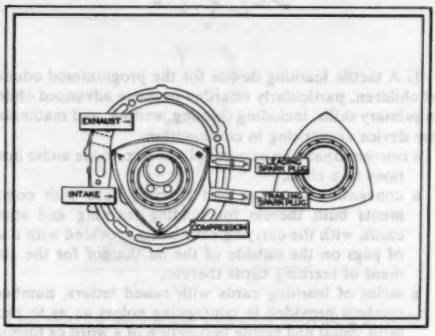
Continuation-in-part of Ser. No. 345,920, March 29, 1973, abandoned. This application July 27, 1973, Ser. No. 383,358
Int. Cl.² G09B 25/02
U.S. Cl. 35—13 4 Claims

1. An educational kit programmed for teaching the assem-

bly, relationship of parts and operation of an internal combustion rotary engine comprising in combination:

a. a simulator board having a surface of magnetically attractive material and having specific graphic indicia on the surface thereof, said graphic indicia including on one area of said board a schematic sectional view of a rotary engine housing, including inner and outer wall portions, and at another area of said board a schematic view of a rotary engine rotor, the indicia on said simulator board being as shown by the non-numerical indicia of FIG. 1;

b. a plurality of magnetically attractive manipulative pieces individually bearing on their surfaces graphic indicia defining diagrams of parts of said rotary engine and another plurality of pieces bearing word indicia naming the various engine parts or defining cycles of engine operation, said pieces including a piece bearing indicia defining a rotary engine rotor with each rotor apex designated, said piece being of a size and shape such that it may be positioned and rotated within the confines of the inner wall portion of said rotary engine housing with each apex touching said inner wall portion, said pieces also including pieces bearing indicia defining rotor seals of size and shape such that they may be positioned in association with the rotor depicted on said simulator board to simulate the construction of rotor apex, corner and side seals,



the indicia on said pieces being as shown by the non-numerical indicia of FIG. 3;

c. a display board for said manipulative pieces including a sheet of magnetically attractive material, said display board having graphic indicia on a surface thereof in spaced relationship, said graphic indicia corresponding to the indicia present on each of said manipulative pieces, said manipulative pieces adapted for storage on and removal from said display board; and

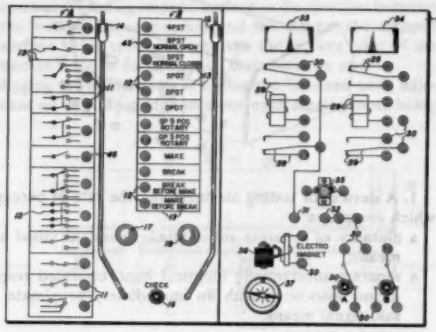
d. audiovisual instructional means including synchronized recordings and visual slides or filmstrips presenting information relevant to the construction and operation of the internal combustion rotary engine including information defining the interrelationship between the indicia on said pieces and the indicia on said simulator board, said audiovisual instructional means further characterized in that it is periodically stoppable to permit the user to perform a manipulative activity requested by the instructional means using said simulator board and said manipulative pieces, and being restartable by the user upon completion of the activity; whereby the assembly, relationship of parts and operation of an internal combustion rotary engine may be simulated by positioning and manipulating said pieces on said simulator board in response to said instructional means.

4,006,538

EDUCATIONAL DEVICE FOR LEARNING SWITCHING

Charles G. Valentine, Stamford, Conn., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 27, 1973, Ser. No. 355,226
Int. Cl.² G09B 23/18
U.S. Cl. 35—19 A **13 Claims**



1. An educational kit for teaching electrical switching and relay operation comprising in combination:

a. audiovisual instruction means for presenting information relating to electrical switching and relay operation said instruction means including a plurality of identified questions and/or answers relevant to subject matter concerning electrical switching and relay operation; and

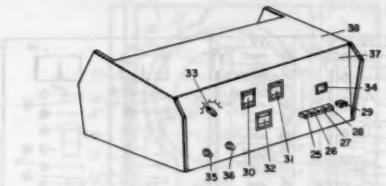
b. a simulator board having graphic indicia on a surface thereof, said board including (i) at a first area on the surface of said board a first plurality of electrical jacks each having in spaced relationship thereto graphic indicia representing a symbol of an electrical switch or relay; an equal number of second electrical jacks each having in spaced relationship thereto graphic indicia representing an identification of said symbols, each one of said first jacks representing a symbol being electrically connected to one of said second jacks which defines the correct identification of said symbol; a first probe adapted to be inserted into said first jacks in response to said instruction means; a second probe adapted to be inserted into one of said second jacks; a check switch; and first and second indicator lamps, whereby the correct matching of a symbol for an electrical switch or relay with indicia representing an identification of said symbol may be obtained by insertion of said probes into said jacks in response to said instruction means; and (ii) at a second area on the surface of said board a plurality of electrical components mounted on said board including relays and switches, the symbols for all of the relays and switches mounted on the second area of said board being graphically depicted on the first area of said board, said components comprising first means adapted to allow the user of said kit to observe the formation of a magnetic field in a relay type circuit; a second means adapted to allow the user of said kit to observe a relay switch in operation; and third means adapted to permit a user to assemble and test relay control circuits, the user of said kit employing said first, second and third means in response to instructions given by said instruction means.

4,006,539

DEVICE FOR TESTING OF A SUBJECT'S ALERTNESS AND RATE OF PERCEPTION

Waclaw Kazimierz Slomski, 426 Wilkinson St., Syracuse, N.Y. 13204

Filed Jan. 28, 1975, Ser. No. 544,204
Int. Cl.² G09B *19/00*
U.S. Cl. 35—22 R 7 Claims



1. A device for testing alertness and the rate of perception which comprises:

a plurality of separate substantially identical visual signal means;

a separate substantially identical hand operated response means associated with an immediately proximate each said signal means;

a counter means;

a timer; and

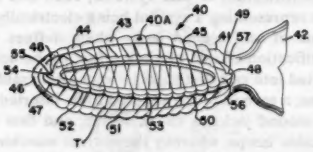
control means for performing the functions of causing said signal means individually to emit signals one by one in a random sequence at a predetermined relatively rapid constant frequency and for a predetermined length of time governed by said timer and causing said counter means to record the number of total times in said length of time that said response means are individually activated while the individual signal means corresponding to the activated response means is emitting signals.

4,006,540

FILAMENT WINDING CRAFT

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Filed Sept. 19, 1975, Ser. No. 615,129
Int. Cl.² B44F *7/00*
U.S. Cl. 35—27 7 Claims



1. An assembly toy and craft comprising in combination:

a first member shaped in the configuration of a closed frame and having integrally formed therein of the material thereof a plurality of irregular formations which are configured to receive and retain a filamentary material,

a second member of sheet-like configuration and having the peripheral border portions thereof shaped with a plurality of irregular formations for retaining a filamentary material,

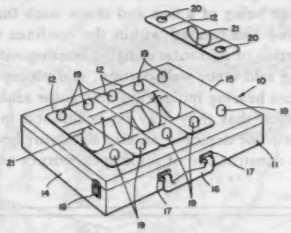
respective inside edge portions of said first frame member and outside edge portions of said second frame member being configured to permit the frictional assembly and retention of said second frame member within and across the inside of said first frame member whereby most of the border portions of said second frame member extend laterally outwardly of said first frame member and wherein said irregularly shaped formations of said first and second frame members are exposed to and may serve as guides for a filamentary material such as a thread, metal wire or flexible plastic filament which is wrapped around the assembly a number of times and may be retained by the side surfaces of said irregular formations as a plurality of turns of a winding of said filamentary material around the assembly of said first and second members wherein each of said turns is substantially fixed in location on the assembly with respect to the other turns of filamentary material.

4,006,541

TACTILE LEARNING DEVICE

Richard Lee Miller, Box 485, Lindsborg, Kans. 67456

Filed Dec. 9, 1975, Ser. No. 639,206
Int. Cl.² G09B *1/10*
U.S. Cl. 35—35 H 1 Claim



1. A tactile learning device for the programmed education of children, particularly retarded or more advanced children, in primary skills, including printing, writing, and mathematics, the device comprising in combination:

a conventional tape cassette player to provide audio instructions to a child;

a conventional storage and carrying case with compartments built therein for holding learning and stimulus cards, with the carrying case being provided with a series of pegs on the outside of the lid thereof for the attachment of learning cards thereto;

a series of learning cards with raised letters, numbers or symbols provided in contrasting colors so as to provide both visual and tactile perception of a word or formula to be learned, said learning cards having holes therein to match the pegs on the outside of the lid of the case to permit a correct arrangement of letters, numbers or symbols in forming a continuous word or formula;

and a series of stimulus cards with a given word, formula, etc. being imprinted in skewed fashion on one side thereof to show the letters, numbers or symbols required to form a given word or formula, with the answer on the reverse side of the stimulus card being provided with the proper arrangement of the letters, numbers or symbols to match the proper arrangement of the learning cards when affixed to the top of the lid of said storage and carrying case;

said learning cards constructed of rigid material, such as plastic, wood, or thick paper, with dimensions of approximately 8 inches long by 3 inches wide to provide easily seen and manually handled learning cards for instructional purposes.

4,006,542

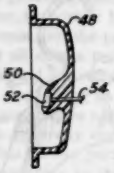
SHOE INSOLE OF A SOLID CRYSTALLINE POLYMER

Lester M. Larson, Wilmington, Del., assignor to Larson Corporation

Filed Nov. 4, 1974, Ser. No. 520,730
Int. Cl.² A43B *13/38*; B32B *27/06*
U.S. Cl. 36—43 8 Claims

1. A shoe insole comprising a heat deformed sheet of solid crystalline polymer of a solid polyolefinic compound, selected

from the group consisting of transpolyisoprene, polychloroprene and each of said polymers with polybutadiene heat softenable at about 60° C and higher and hardenable by crystallization to rigid hardness upon cooling to about 40° C, said



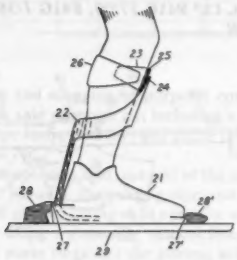
polymer being formed into a sheet sized and shaped to fit as an insole in a shoe and molded in its heat softened state at a body comfortable temperature to at least a portion of the wearer's foot.

4,006,543

SKI BOOTS PROVIDING AMPLIFICATION OF EDGING ACTION

Daniel Post, P.O. Box 408, Averill Park, N.Y. 12018

Filed Oct. 7, 1975, Ser. No. 620,412
Int. Cl.² A43B *5/04*
U.S. Cl. 36—121 **27 Claims**



1. A ski boot for association with a ski, providing amplification of edging action, comprising

a first means for holding the foot of a skier,

a lever having high lateral stiffness extending up from said first means to the front of the lower leg of said skier,

a second means connected to an upper portion of said lever to engage a front portion of said leg to restrict forward and lateral motion of said lever with respect to said front portion of said leg,

a third means engaging said leg to restrict rearward motion of said leg with respect to said lever,

and a fourth means whereby a ski may be firmly secured to said boot,

wherein the construction of said lever and the construction of structural elements connecting said lever and said fourth means provides very large resistance to lateral angular motion of said lever with respect to said ski when said ski is secured to said boot,

characterized by an absence of substantial restriction of rotation of said lower leg about an axis through the front of said lower leg.

4,006,544

REPLACEABLE CUTTING EDGE ASSEMBLY

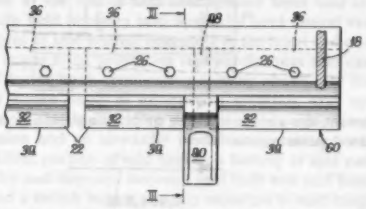
Visvaldis A. Stepe, Willow Springs, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed May 12, 1975, Ser. No. 576,780
Int. Cl.² E02F *9/28*
U.S. Cl. 37—141 T **8 Claims**

1. A replaceable cutting edge assembly for an earthmoving bucket having a floor, comprising:

a plurality of cutting edge sections arranged along a leading edge of the bucket floor, each cutting edge section including a wedge shaped portion extending forwardly from the leading edge of the bucket floor to define a cutting edge and a flange extending rearwardly from the wedge shaped portion to form a junction therewith, each said flange underlapping the bucket floor, the flange and the bucket floor defining holes alignable one with the other for receiving bolt means to secure the cutting edge section in place, each cutting edge section also including a rearwardly facing stepped surface at the junction between the wedge shaped portion and the flange, the stepped surface being spaced apart from the leading edge of the bucket floor to form a space therebetween and

a digging tooth arranged at a juncture between each adjacent set of cutting edge sections, each digging tooth being



formed with a generally wedge shaped tooth section extending forwardly of the wedge shaped portions of the cutting edge sections, a rearwardly extending overlapping portion of each tooth being configured to overlap the wedge shaped portions of the cutting edge sections with a vertically arranged, non-apertured tang extending downwardly from the rearwardly extending portion to fill the space between the leading edge of the bucket floor and the stepped surfaces of the two adjacent cutting edge sections, each digging tooth further including a rearwardly extending underlapping portion associated in an underlying relation with the bucket floor, said tang extending sufficiently downwardly to retain the tooth on the cutting edges, whereby the tang and the underlapping portion cooperate with adjacent cutting edges to retainably associate each tooth with the bucket.

4,006,545

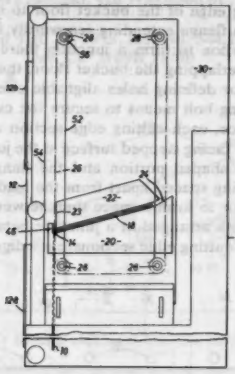
DISPLAY DEVICE

William Mathews, 22, Queenscourt, Wembley Park, Middlesex, England

Filed Apr. 14, 1975, Ser. No. 567,809
Int. Cl.² G09F *11/30*
U.S. Cl. 40—36 **7 Claims**

1. A display device having a viewing aperture, front, back and two sides, including: a series of cards each bearing the information to be displayed, a series of support member each having two ends, each of said cards being secured to a single support member between its ends, means within the device providing an inclined surface sloping downwardly and forwardly towards the front of the device and disposed at one side of the device and a corresponding inclined surface disposed opposite and at the other side of the device such that each of said ends of the support member rests respectively on one of said sloping surfaces, a pair of continuous loops operably connected one at each side of the device, drive means for controllably driving the loops in synchronism around loop guide members defining a circuit within the device, a series of square shaped pick-up elements secured at their centers along each loop, said elements having means for engaging and lifting respective ends of each support member in a manner such that consecutive pairs of said elements are in horizontal alignment, guide means for each series of square shaped pick-up elements comprising parallel guide rails shaped and positioned to allow

the pick-up elements to move therebetween and around a closed circuit as the loops are driven but substantially to



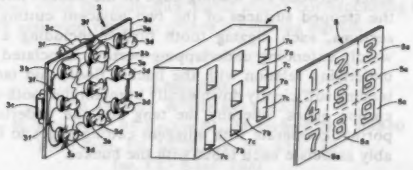
prevent the elements tilting or pivoting relative to their associated guide means.

4,006,546

BACK-LIGHTED DISPLAY ARRANGEMENT

Richard W. Anderson, Reading, and Frederick F. Bodenrader, Georgetown, both of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed May 19, 1976, Ser. No. 688,058
Int. Cl.² G09F *13/00*
U.S. Cl. 40—132 D **5 Claims**



1. A back-lighted display arrangement, comprising:
a light source support member supporting a plurality of light source means thereon;
display means including a plurality of display areas each of which is associated with a different one of the plurality of light source means and is arranged to be back-lighted by light emitted by the associated light source means; and
a light baffle of a compressible material compressively sandwiched between the light source support member and the display means for establishing a light seal between the baffle and the light source support member and display means, said compressed light baffle having portions defining a plurality of compartments each arranged to receive a different one of the plurality of light source means whereby light emitted by the light source means is directed onto the display area associated with the light source means.

4,006,547

GARMENT HANGER WITH INDICIA MEANS

Howard Samuels, Brooklyn, N.Y., and Robert Phillips, Fort Lee, N.J., assignors to Warbern Packaging Industries, Inc., Keasbey, N.J.

Filed Oct. 2, 1975, Ser. No. 618,975
Int. Cl.² G09F *3/00*
U.S. Cl. 40—322 **7 Claims**

1. In combination, a garment hanger of the raised neck type and indicia means, said hanger and said indicia means including cooperating means for removably connecting said indicia means to said hanger at said raised neck, said indicia means including a substantially planar surface for receiving informa-

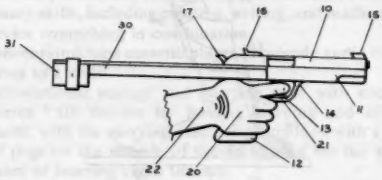
tion supplied thereto and said cooperating means including a plug-in member of preselected shape formed integrally as part of said indicia means and a slot of a configuration mating with said plug-in member formed integrally with said hanger, said plug-in member being removably mounted in said slot.

4,006,548

COUNTERBALANCE FOR HANDGUN

Walter R. Vignini, 1745 Congress Ave., Peekskill, N.Y. 10566

Filed Sept. 4, 1975, Ser. No. 610,098
Int. Cl.² F41C *27/00*; F41G *1/38*
U.S. Cl. 42—1 W **9 Claims**



1. In a handgun having a barrel and a hand grip; said hand grip being adapted for engagement by the hand of the user with the gun held forwardly of the arm and wrist of the user;
a counterbalance arm securable to said gun and extending rearwardly of said hand grip in a direction opposite to the barrel;
said counterbalance arm being free of the hand, wrist and arm of the user;
said counterbalance arm providing a rotative moment rearwardly of the wrist of the user opposite to the rotative moment of the handgun.

4,006,549

PORPOISE-RELEASING TUNA PURSE SEINE

James M. Seabrooke, 1550 Mountain View Ave., Petaluma, Calif. 94952

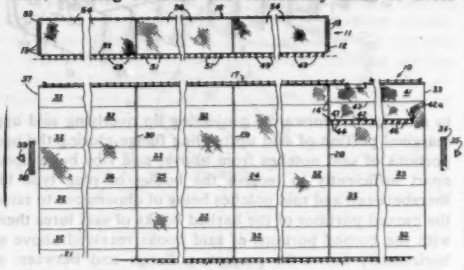
Filed Mar. 18, 1976, Ser. No. 668,295
Int. Cl.² A01K *73/12*
U.S. Cl. 43—14 **16 Claims**

1. A tuna purse seine, comprising:
a main net having an upper corkline and a lower lead line, with purse rings connected to the lead line, most of the webbing of said main net being of a predetermined mesh size suitable for capturing tuna, said net having one area of webbing with a mesh size sufficiently small to avoid damaging and snagging of porpoise coming in contact therewith, said one webbing area being adjacent to one end of the net and extending from the corkline down through a portion of the depth of the net and said one

webbing area including means for releasing porpoise below the water line;

said main net further including a pursing skirt of webbing generally similar in mesh size to said one webbing area of the main net, said skirt depending from the interior side of the main net generally along a line below and spaced from the corkline, its bottom being of less depth than the bottom of the main net, the position of the pursing skirt being such that all of the main net webbing above the pursing skirt is in said one webbing area, said pursing skirt including purse rings along its lower edge;

a porpoise net for connection to the interior side of the main net, of a length generally corresponding to that of the main net less that of the pursing skirt, and of a depth generally corresponding to the depth distance between the corkline and the bottom of the pursing skirt, said porpoise net having, at least in an area adjacent to one end, webbing of mesh size sufficiently small to avoid



damaging and snagging of porpoise coming into contact therewith, said porpoise net including a corkline along its upper edge and a lead line and purse rings along its lower edge; and

means for connecting said one end of the porpoise net to the main net, between the pursing skirt and the corkline, and to the end of the pursing skirt opposite said one end of the main net along a generally vertical line, so that the porpoise net purse rings and the pursing skirt purse rings are generally aligned and continuous for receiving a common purse line;

whereby said porpoise net and pursing skirt may be pursed while said main net is independently pursed, dividing off an upper portion of the enclosed main net space and locating the divided-off portion, when the porpoise net and pursing skirt are pursed, adjacent to the porpoise releasing means so that porpoise trapped therein can be released.

4,006,550

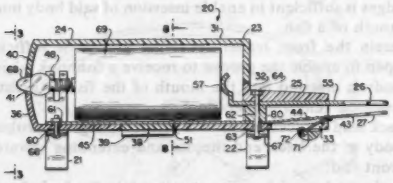
BITE INDICATING FISHING LIGHT

John Rizzo, 1546 W. 11th St., Brooklyn, N.Y. 11204

Filed Dec. 8, 1975, Ser. No. 638,977

Int. Cl.² A01K 97/12

U.S. Cl. 43—17 **3 Claims**



1. A bite indicating light to be attached to a fishing rod having a reel and a line extending therefrom, said light comprising, in combination, a hollow casing having first and second longitudinal halves forming a cylindrical portion having a front and rear end, said front end containing a central opening, an extension from the rear end of said cylindrical portion having a rear opening integrally formed with said first longitudinal half and a longitudinal slot along the bottom thereof, a central longitudinal tubular hinge element integrally formed with said second longitudinal half, and integrally molded fastening means on said longitudinal halves opposite said hinge element; clip means fixed to said first longitudinal half attaching said casing to a fishing rod; a lower hook projecting from said casing adjacent to said rod, said lower hook having a shank extending through said rear opening in said extension, a base from which said shank extends fixed in said first longitudinal half, a longitudinal pin bent from said base entering said tubular hinge element hinging said first and second longitudinal halves together, and upwardly bent lateral extensions of said base at the end of said base remote from said lower hook; a bulb held between said upwardly bent lateral extensions adjacent to said central operating at the front end of said casing; an upper hook projecting rearwardly from said casing above said lower hook terminating directly above said lower hook, said hooks being of conducting material, said upper hook having a shank extending through said rear opening in said extension and an upwardly bent battery contact within said cylindrical portion of said casing; a battery in said casing contacted by and disposed between said bulb and said battery contact; and a switch button slidably mounted in said longitudinal slot of said extension contacting said lower hook shank urging said lower hook upward into contact with said upper hook on the sliding of said button, said fishing line extending through said hooks so that tension on said fishing line pulls said hooks into contact with each other lighting said bulb.

4,006,551

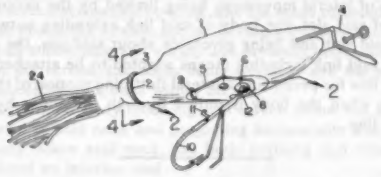
ARTIFICIAL BAITS

Howard E. Messacar, 696 Durie St., Toronto, Ontario, Canada (M6S 3H3)

Filed July 16, 1975, Ser. No. 596,420

Int. Cl.² A01K 85/00

U.S. Cl. 43—42.04 **4 Claims**



1. An artificial bait comprising:

a body portion;

a plate member secured to an underside of said body portion, the plate member having an aperture therethrough; the body portion having a blind recess in registry with said aperture;

a wire member having a free end extending upwardly into said recess and terminating in spaced relation to the end of the recess, the wire member being bent in a J-shape within said aperture and having its other end enclosed above the plate member,

and a hook having an eye at one end for engagement over said free end through the aperture.

4,006,552

FISHING LURE

Patrick J. Cunningham, 12250 Wayburn Ave., Detroit, Mich. 48224

Filed Oct. 17, 1975, Ser. No. 623,481
Int. Cl.² A01K *85/00*
U.S. Cl. 43—42.48 **5 Claims**

1. A fishing lure comprising a unitary elongated body adapted to loosely suspend hooks therefrom, said body being generally L-shaped and including an elongated head portion and an elongated tail portion, the juncture of said head and tail portions being the widest with the head portion and the tail portion each being provided with a taper near the free end thereof, said head portion having a generally flat upper surface and a plano-convex cross-sectional form throughout its longitudinal extend and a generally arcuate tapered free end, said tail portion having an arcuate convexo-convex cross-sectional form throughout its longitudinal extent, said head portion including an elongated longitudinal slot in said flat upper surface, said slot defining major side wall portions which are generally perpendicular to said flat upper surface and generally parallel to a longitudinal axis through the head portion, a mounting pin extending laterally through said slot and having the ends of the pin rigidly anchored in the major side walls of said slot, said mounting pin being essentially perpendicular to the longitudinal axis of the head portion, an elongated link having a substantially closed loop at one end thereof, said loop being disposed in said slot and being loosely mounted around said pin, said loop having a lateral width less than the lateral width of said slot and being freely movable laterally on said pin along the lateral axis thereof in a direction essentially perpendicular to the longitudinal axis of the head portion, the degree of lateral movement being limited by the major side walls of said slot, the body of said link extending outwardly from said slot and being pivotable about said pin, the other end of said link including means adapted to be attached to a fishing line for permitting a lateral fluttering motion of the tail section when the body is pulled through the water by said fishing line.

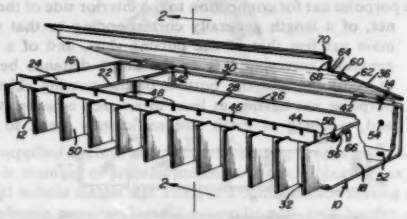
4,006,553

FISHING LURE TRAY WITH HINGED COVER

Stephen G. Porter, 1020 NW. 49th St., Fort Lauderdale, Fla. 33313, and Theodore J. Adams, 4280 NW. 10th Terrace, Fort Lauderdale, Fla. 33315

Filed Apr. 22, 1976, Ser. No. 679,313
Int. Cl.² A01K *97/06*
U.S. Cl. 43—54.5 R **7 Claims**

1. A tray for fishing lures, said tray including upstanding front, rear and opposite side walls and a bottom wall extending between and interconnecting the lower marginal edge portions of said front, rear and opposite side walls, the upper marginal edge portion of said front wall including a generally horizontal forwardly projecting flange extending therealong, a plurality of upstanding ribs carried by said front wall, spaced longitudinally therealong and projecting forwardly thereof as well as said flange, the forwardly projecting flange terminating forwardly in an upstanding flange whose upper marginal portion is provided with upwardly opening notches each spaced therealong centrally intermediate adjacent ribs, said tray including a cover removably positionable in position closing the upper portion of said tray and including a forward marginal edge overlying the upper marginal edge of said front wall and including an upwardly projecting flange terminating upwardly



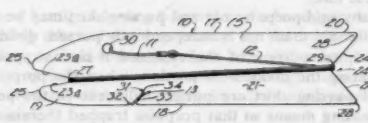
in a horizontal forwardly projecting lip overlying said upper marginal portion of said upstanding flange closing the upper portions of said notches from above, said ribs being spaced apart sufficiently to receive the bodies of plug type lures therebetween and said notches being of dimensions to receive the curved portions of the barbed hooks of said lures therein with the barbed portions of said hooks received above said horizontally forwardly projecting flange and between said upstanding flange and said upwardly projecting flange below said lip.

4,006,554

FISHHOOK REMOVER AND LEADER STORAGE DEVICE

Richard P. Tice, 3211 N. Nelson, Spokane, Wash. 99206, and Donald L. Galbraith, 6205 N. Nevada, Spokane, Wash. 99207

Filed July 17, 1975, Ser. No. 596,714
Int. Cl.² A01K *97/06*
U.S. Cl. 43—57.5 R **2 Claims**



1. A fishhook remover and hook and leader storage device, comprising:

an elongated body having top and bottom longitudinal edges extending between front and back ends and with planar parallel side surfaces joining said top and bottom edges and front and back ends;

a front leader receiving groove formed integrally within the body at the front end thereof extending toward the back end;

wherein the lateral distance between said top and bottom edges is sufficient to enable insertion of said body into the mouth of a fish;

wherein the front leader receiving groove is sufficiently open to enable the groove to receive a fishhook when the body is inserted into the mouth of the fish to assist in a fishhook removal operation;

a back leader receiving groove formed integrally within the body at the back end thereof and extending toward the front end;

a leader end receiving slit extending into the body from the bottom longitudinal edge toward the top edge;

wherein said slit extends in a curve inward and rearward from the bottom longitudinal edge with a diminishing

thickness between slit edges to securely grip a leader end therein; and

an open hook shank receiving hole formed through the body between the side surfaces adjacent the top edge.

4,006,555

DOLL WITH INCREMENTALLY MOVABLE ARM

Donald E. England; George P. Giordano, both of Cincinnati, Ohio; Garland C. Thompson, Dillsboro, Ind., and James J. Wright, Loveland, Ohio, assignors to General Mills Fun Group, Inc., Minneapolis, Minn.

Filed June 11, 1975, Ser. No. 585,940

Int. Cl.² A63H *33/00*

U.S. Cl. 46—119 **20 Claims**

1. An articulated toy figure comprising a torso, a head, means for movably connecting said head to the upper portion of said torso, a pair of legs, means for connecting said legs to the lower portion of said torso, a pair of articulated arms, means for connecting said arms to the torso so that they are movable with respect thereto at respective shoulder connections, means for imparting incremental movement to one of said arms relative to said torso from a first position to a second position, said movement imparting means including a transmission system mounted within said torso, said transmission system being operatively connected to said one arm, means for activating said transmission system, means for placing said transmission system in gear whereby rotational movement is imparted to said one arm in increments in response to activation of said transmission system, said means for placing said transmission system in gear permitting said transmission system to be taken out of gear so that said one arm is freely movable.

4,006,556

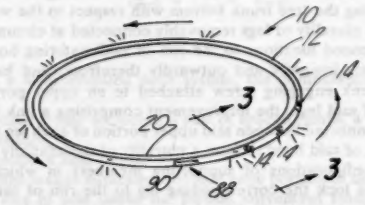
ILLUMINATED HULA HOOP

Mervin R. Williams, 305 E. Jackson Ave., Flint, Mich. 48505

Filed Aug. 11, 1975, Ser. No. 603,343

Int. Cl.² A63H *1/32, 33/26*

U.S. Cl. 46—228 **6 Claims**



1. A hoop toy, comprising:

a. a toroidal member having a hollow interior, the toroidal member comprising:

1. a first arcuate wall having a first flange and a second flange, the flanges being diametrically opposed and inwardly directed toward the radial center of the wall,
2. a second arcuate wall having a first flange and a second flange, the flanges being diametrically opposed and inwardly directed toward the radial center of the wall,
3. the first flanges and the second flanges being adapted to be in abutting engagement,
4. locking means associated with the flanges for interengaging the arcuate walls, the locking means comprising a plurality of apertures disposed around one of the first flanges and one of the second flanges and a plurality of projections disposed on the other of the first flanges and the other of the second flanges, the projections of the first flange being received by the apertures of the other first flange, the projections of the second flange being received by the apertures of the other second flange to interengage the arcuate walls, and

b. means for emitting light disposed in the interior of the toroidal member, the light emitting means comprising a single source of power.

4,006,557

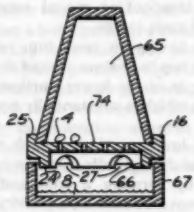
SPROUTING DEVICE

George M. Sawyer, 3435 W. 110th St., Inglewood, Calif. 90303

Continuation of Ser. No. 380,457, July 18, 1973, abandoned. This application June 30, 1975, Ser. No. 591,656

Int. Cl.² A01G *31/02*; B01D *23/00*

U.S. Cl. 47—61 **4 Claims**



1. A seed sprouting device comprising

a. an inverted transparent jar having a bottom neck forming an opening, the jar containing water and seeds prior to being inverted, said neck having a bottom level,

b. a screen across said opening, and the seeds retained in the jar above the screen, the jar having a frusto-conical side wall which tapers upwardly and inwardly above the level of the screen, the seeds being sprouted and the sprouts extending as a mass within the jar,

c. an annular body receiving said screen below the bottom level of said neck and projecting horizontally and annularly below said neck, the body defining and extending about an interior, and

d. a receptacle removably supporting said body and extending therebelow, the receptacle defining and extending about an interior, the receptacle and body interfitting annularly to close said interior of the receptacle from the exterior,

e. whereby water in the jar may drain downwardly through said neck opening, said screen and said annular body into said receptacle, while said seeds in the jar are retained above the screen,

f. the body having a depending flange which forms an air inlet to communicate between the exterior and said interior of the body, said flange relieved upwardly from the lower edge thereof to form said inlet, confined at said lower edge,

g. said screen being circular and located in the body,

h. said body defining annular step shoulders one of which seats the jar neck and the other of which seats on the receptacle, said screen being at the level of one of said step shoulders,

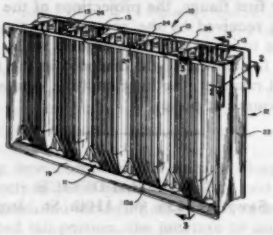
i. said jar neck, said receptacle and said body adjacent the neck being free of threaded interconnections.

4,006,558

SEEDLING PLANT PROPAGATION CONTAINER

Keith S. Neddo; G. Michael Alder, both of Holiday, and James L. Gwilliam, Jr., Salt Lake City, all of Utah, assignors to Native Plants, Inc., Salt Lake City, Utah

Filed Sept. 11, 1975, Ser. No. 612,370
Int. Cl.² A01G 9/02
U.S. Cl. 47—77 **7 Claims**



1. A freestanding multiple cavity planting device capable of reuse comprising,

a. two separate sidepieces of equal dimensions frictionally held together by interlocking means on both sides of each cavity, said interlocking means extending substantially the length of each cavity,

b. each cavity having an open top, vertical corrugations running from top to bottom around the perimeter thereof and tapering in at the lower portion, terminating in an open bottom which is substantially smaller than the open top,

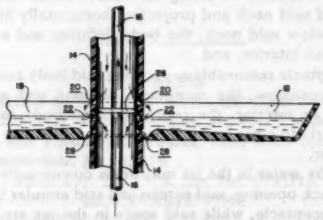
c. the extreme lower portion of each sidepiece extending outwardly and downwardly from the open bottom of each cavity thereby forming a freestanding platform base wherein the open bottom of the cavity is above said base.

4,006,559

SELF-IRRIGATING DISPLAY RACK FOR POTTED PLANTS

Richard A. Carlyon, Jr., 1000 Sharrow Way, Carson City, Nev. 89701

Filed Sept. 15, 1975, Ser. No. 613,079
Int. Cl.² A01G 27/00; A47G 7/02
U.S. Cl. 47—39 **5 Claims**



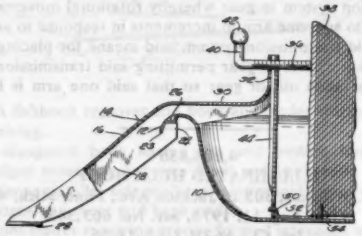
1. A display rack for potted plants, and the like, comprising: a bucket-like base forming a reservoir for irrigating water; an elongated upright tubular member supported on said base and extending upwardly therefrom; a plurality of display dishes mounted in a spaced tiered relationship on said tubular member over said reservoir each of said display dishes having a bottom and an open top; a pipeline extending upwardly through said tubular member from the reservoir to the upper end of said tubular member; a pump mounted in the reservoir and having an outlet coupled to the pipeline for pumping irrigating water from the reservoir up through the pipeline; outlet means mounted on said pipeline at the top of said tubular member to direct water out of the pipeline into the interior of the tubular member to be returned to said reservoir through said tubular member; said tubular member having first openings therein directly over each dish supported thereon, and said tubular member further having second openings therein at a predetermined level in each dish supported thereon; and a corresponding plurality of annular plug members mounted within said tubular member coaxially with said pipeline and filling the space between the pipeline and the inner wall of the tubular member, said plug members being respectively interposed between the first and second openings in said tubular member to divert the irrigating water in the tubular member out through the first openings therein and into the display dishes, with the water being returned to the tubular member through the second openings therein after reaching a predetermined level in the individual display dishes so as to cause the display dishes from the top of the display rack down to the bottom thereof to be sequentially filled with irrigating water.

4,006,560

CHRISTMAS TREE STAND

Donald A. Schulz, Milwaukee, Wis., assignor to S-B Manufacturing Co. Ltd., Milwaukee, Wis.

Filed Feb. 9, 1976, Ser. No. 656,555
Int. Cl.² A47G 33/12
U.S. Cl. 47—40.5 **6 Claims**



1. In a Christmas tree stand having a watering bowl, means stabilizing the tree trunk bottom with respect to the watering bowl, a plurality of legs removably connected at circumferentially spaced locations to the rim of said watering bowl and extending inwardly and outwardly therefrom, and having a tree trunk engaging screw attached to an upper portion of each of said legs, the improvement comprising a link removably connected between said upper portion of each leg and the bottom of said bowl to form a plurality of substantially triangular configurations of supporting members in which each tends to lock the corresponding leg to the rim of said bowl when the corresponding trunk engaging screw is tightened and tends to loosen the connection between said leg and the rim of said bowl when said trunk engaging screw is loosened.

4,006,561
PLANT PACKAGE AND METHOD OF PREPARING THE SAME

Gustav Thoma, Eberbach; Fritz Tscharf, Hassmersheim, and Helmut Astinet, Miltenberg, all of Germany, assignors to Pflanz-Frisch Transportsack GmbH, Hassmersheim (Neckar), Germany

Continuation-in-part of Ser. No. 222,353, Jan. 31, 1972, abandoned. This application Sept. 7, 1972, Ser. No. 286,964
Claims priority, application Germany, Feb. 5, 1971, 2105348

Int. Cl.² A01B *79/00*

U.S. Cl. 47—58 **12 Claims**

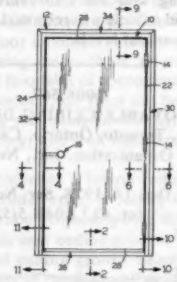
1. A method of storing a living plant which comprises:
   a. enclosing said plant in an envelope of sheet material,
      1. said envelope being permeable to not more than 30% of incident visible light, substantially impervious to infrared radiation, waterproof, permeable to the gaseous components of atmospheric air, but not substantially more permeable to gaseous oxygen, carbon dioxide, and water vapor than low-density polyethylene film having a thickness of 20 microns;
   b. storing the enclosed plant;
   c. withdrawing the stored plant from said envelope; and
   d. planting the withdrawn plant in soil.

4,006,562
DOOR SYSTEM WITH IMPROVED WEATHERSEAL

Nicholas E. Belanger, Troy; Floyd Bentley, Pontiac, and David C. Geoffrey, Troy, all of Mich., assignors to The Stanley Works, New Britain, Conn.

Filed Jan. 2, 1976, Ser. No. 646,179
Int. Cl.² E06B *1/00*, *7/16*

U.S. Cl. 49—380 **21 Claims**



1. In a weathersealed door system, the combination comprising:
   A. a door frame including a pair of spaced jambs, a sill and a header;
   B. a door in said frame;
   C. hinge means mounting one side edge portion of said door to one of said jambs for pivotal movement from a first position within said frame to a second position wherein the opposite side edge portion of said door is disposed outwardly therefrom;
   D. a sill weatherseal member extending along the bottom edge of said door, said sill weatherseal member including a tubular depending portion extending along the width of said door, said depending portion being of a height greater than the spacing between said bottom edge of said door and said sill and being deflected into close engagement with the surface of said sill in said first position of said door;
   E. a header weatherseal member extending across the top edge of said door and being resiliently deflected in said first position of said door;
   F. a first hinge jamb weatherseal member extending along the jamb to which said hinge means is mounted from said header weatherseal member to said sill;
   G. a second hinge jamb weatherseal member extending upwardly from said sill and adjacent said first hinge jamb weatherseal member, said second hinge jamb weatherseal member being fabricated of highly compressible material and of a thickness greater than the spacing between the side edge of the door and the jamb so that it is compressed when said door is in said first position by both the side edge of said door and said sill weatherseal member;
   H. a first latch jamb weatherseal member on the jamb opposite that having said hinge means mounted thereon and extending from adjacent said header to a point spaced above said sill, said latch jamb weatherseal member having a cross section providing a first portion mounted on the jamb and a deflectable portion laterally therefrom for engagement with the surface of said door in said first position thereof and providing an internal channel at least adjacent the sill end thereof; and
   I. a second latch jamb weatherseal member mounted on said opposite jamb and extending upwardly from said sill below said first latch jamb weatherseal member, said second latch jamb weatherseal member having a cross section providing a body portion, a deflectable lip portion projecting laterally from said body portion towards the door and an interseal portion projecting upwardly into said channel of said first latch jamb weatherseal member, said second latch jamb weatherseal member being fabricated of highly compressible material and being compressed by said door in said first position thereof with said lip portion abutting the side edge of the door.

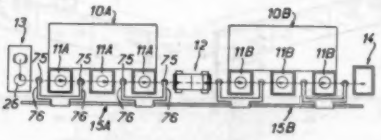
4,006,563
MACHINE FOR MACHINING TWO FACES OF AN OPHTHALMIC LENS

Guy Charlot, Provins, France, assignor to Essilor International (Compagnie Generale d'Optique), Joinville-lePont, France

Filed July 7, 1975, Ser. No. 593,458
Claims priority, application France, July 12, 1974, 74.24280

Int. Cl.² B24B *47/02*, *13/02*

U.S. Cl. 51—109 R **9 Claims**



1. A machine for sequential machining of two faces of an ophthalmic lens, comprising a first work station group for machining one face of each lens, a second work station group for machining the other face of each lens, transfer means for effecting advance of lenses from said first work station group to said second work station group, a lens turn-over station disposed in series between said first and second work station groups, said lens turn-over station including a conveyor means and a tipping rod disposed transverse to the direction of for-

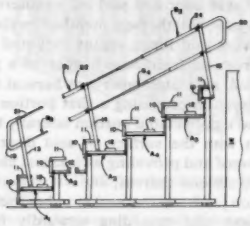
ward movement of said conveyor means, said transfer means being operative to pick up the lens machined at said first working station group and to release said lens above and to the upstream side of said tipping rod relative to said direction of forward movement of said conveyor means with the periphery of the lens on the downstream side of said lens approximately in alignment with the tipping bar, whereby said periphery of the lens strikes said tipping rod and then an opposite portion of said lens falls onto said conveyor means which then moves said opposite portion in said direction of forward movement relative to said periphery thereby to turn the lens over.

4,006,564

FOLDABLE HAND RAIL AND SEATING STRUCTURE

Harold Wiese, North Highland, P.O. Box 236, Madison, S. Dak. 57042

Filed Jan. 21, 1976, Ser. No. 650,841
Int. Cl.² E04H *3/12*
U.S. Cl. 52—9 **12 Claims**



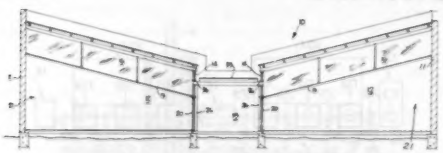
1. A hand rail or the like in combination of multiple seating sections which fold from a normal seating configuration to a generally vertical storage position, comprising at least two spaced posts, means for attaching the lower ends of said posts to spaced seating sections, and a rail member having its one end pivotally connected to one of said posts, the second of said posts having an extension attached thereto which is movable upwardly of said second post, the other end of said rail member being pivotally connected to said extension, whereby when said one of said spaced seating sections is moved toward the other said extension may move upwardly of said second post.

4,006,565

SQUASH COURT CONSTRUCTION

Graham Ralph Thompson, and Dean Henry Stone, both of 125 Glenn Osmond Road, Eastwood, South Australia (5063)

Filed Oct. 17, 1975, Ser. No. 623,470
Int. Cl.² E04B *7/12*; **A63B** *69/38*
U.S. Cl. 52—18 **8 Claims**



1. A building containing a plurality of squash courts, comprising two spaced parallel outer side walls, two parallel outer end walls extending between the side walls and each at right angles thereto,

two outer roof portions extending between the end walls and terminating at their adjacent edges above spaced parallel clerestory windows,

glass walls below the clerestory windows defining between them a central gallery which extends parallel to said side walls,

a central roof portion over the gallery, and

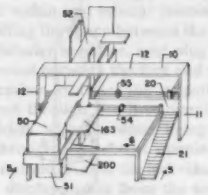
division walls parallel to the end walls and extending between the side walls and the gallery glass walls defining therebetween said plurality of squash courts, arranged in two rows one on each side of the gallery.

4,006,566

ARCHITECTURAL SYSTEM

Kreso Forgiarini, 2998 N. Lake Ave., Altadena, Calif. 91101

Filed May 30, 1974, Ser. No. 474,356
Int. Cl.² E04B *1/345*
U.S. Cl. 52—64 **32 Claims**



1. An architectural system including a pair of main vertical columns in spaced relationship and joined by a generally horizontal elevated beam;

said horizontal beam supporting a gallery of sufficient width to allow pedestrians passage;

at least one pair of additional columns in spaced relationship joined by a generally horizontal beam and constituting a secondary frame;

said horizontal beam being at generally the same elevation as the beam of said main frame;

at least one cubicle supported by said main beam and the beam of said secondary frame for movement in the direction generally parallel to the longitudinal direction of said beam of the main frame and a beam of said secondary frame;

means for providing pedestrian access between the level of the base of said columns and said gallery;

said cubicle including at least one rotatable wall;

said rotatable wall including shaft means horizontally mounted with respect to said cubicle and journaled for rotation with respect to said cubicle to rotate said wall; and

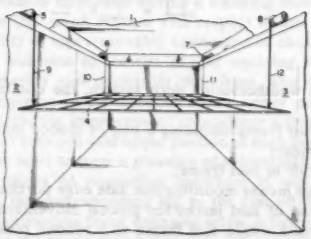
means mounting said shaft for vertical movement with respect to said cubicle whereby said wall may be rotatable at different vertical levels.

4,006,567

MOVABLE CEILING DEVICE

Joe W. Flannery, Toronto, Ontario, Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Oct. 14, 1975, Ser. No. 621,815
Int. Cl.² E04B *5/52*
U.S. Cl. 52—126 **2 Claims**



1. A movable ceiling device for a room having a ceiling and

a pair of opposite spaced substantially parallel walls, said ceiling device comprising

a false ceiling;

a plurality of brackets affixed to the opposite walls a close distance beneath the ceiling in mutually spaced relation;

a plurality of motors above the false ceiling and mounted on the brackets;

a plurality of pulleys, each coupled to, and rotated in opposite directions by, a corresponding one of the motors; and

a plurality of cable-type support members each having a first end affixed to the false ceiling at a corresponding point thereof and a second end affixed to a corresponding one of the pulleys in a manner whereby the false ceiling is supported in substantially parallel spaced relation with the ceiling of the room and is selectively varied in its distance from the ceiling of the room by operation of the motors.

4,006,568

BI-LAMINAR PRE-FINISHED WALL ELEMENT AND METHOD OF ASSEMBLING SAME

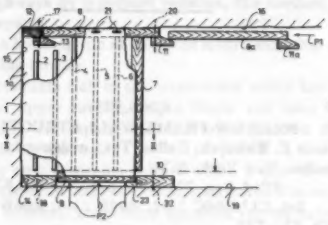
Peter Pertl, Tulpenweg 3, D-82 Rosenheim, Germany

Continuation of Ser. No. 581,352, May 27, 1975, abandoned. This application Apr. 30, 1976, Ser. No. 682,101

Claims priority, application Germany, May 25, 1974, 2425432

Int. Cl.² E04B *2/80, 2/88*

U.S. Cl. 52—241 **5 Claims**



1. Merging inner wall units for installation in building structures to have finished floors and ceilings and consisting of at least first and second prefabricated wall units, each unit having two opposed outer sheet surfaces separated by spacing members forming a frame and wherein the top and bottom edge surfaces of the wall units are provided with continuous ceiling grooves and floor channels respectively, said grooves and channels each being respectively arranged to accept a ceiling slat and a fixed floor slat of approximately corresponding rectangular cross-section, the floor slat being a part of said frame, and said ceiling slat being further arranged to be fastened to the room ceiling, said wall units being characterized in that:

a. each wall unit comprises a lateral remote vertical edge and a lateral proximal edge, a ceiling inner starter slat piece having a portion projecting over the remote edge of the wall unit within said ceiling groove, with the remaining portion of said ceiling groove being arranged to receive the ceiling slat of the said wall unit, with said proximal end of said ceiling slat having a projecting portion with a projecting wedge protrusion extending slopingly downwardly and over the lateral remote vertical edge of the adjacent wall unit to be subsequently installed for receiving a ceiling slat associated with said adjacent wall unit to be subsequently installed;

b. each wall unit having a floor slat element therein, said floor slat element having a length less than the width of the wall unit to which it is attached, said floor slat element being disposed along a substantial portion of said wall and extending to said proximal vertical edge and cooperating with an extension segment extending longitudinally outwardly from said floor slat, the proximal end of said floor slat having a wedge surface extending slopingly upwardly, and the opposed end surface of said segment having a corresponding wedge surface extending slopingly downwardly, said extension segment being arranged for accepting the floor channel of an adjacent wall unit to be subsequently installed, and being further adapted to be disposed horizontally adjacent the complementary wedge surface of said floor slat for raising said first wall unit upwardly from the floor surface.

4,006,569

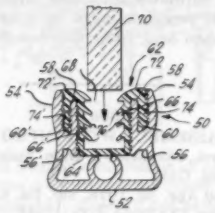
PANEL MOUNTING

Oscar Kain, Van Nuys, Calif., assignor to Monarch Mirror Door Co., Inc., Van Nuys, Calif.

Filed Oct. 2, 1975, Ser. No. 619,019

Int. Cl.² E04B *1/62*

U.S. Cl. 52—397 **10 Claims**



1. A channel and a gasket assembly for mounting an edge portion of a panel comprising:

a channel member having an elongated supporting base and an upstanding wall extending longitudinally along one edge of said base and defining a recess therewith for receiving an edge portion of a panel; and

a resilient gasket adapted to be received in said recess to provide a protective surface therein, said gasket having a web and an upstanding side wall to conform with said recess, said gasket side wall carrying a flap;

said channel member further having means forming a longitudinal slot intermediate the upper edge of said upstanding wall and the juncture with said base, said slot opening adjacent to and parallel with the upper edge of said upstanding wall, whereby said flap of said resilient gasket is fully inserted into said slot in a continuous and coextensive engagement therewith to firmly secure said resilient gasket in said channel member.

4,006,570

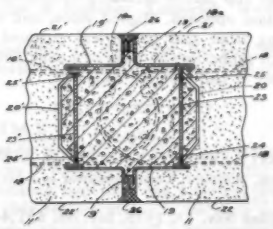
WALL STRUCTURE AND MANUFACTURING METHOD THEREFOR

Owen M. Stolz, 845 W. Centerville Road, Dayton, Ohio 45459

Filed Apr. 1, 1974, Ser. No. 456,713

Int. Cl.² E04B *2/00*

U.S. Cl. 52—432 **3 Claims**



1. A structural component for use in erecting a frameless structure comprising

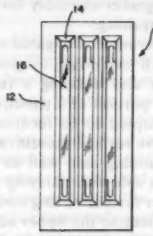
a panel formed of a cement material and having
a pair of opposed surfaces with
a peripheral edge portion extending between said surfaces,
reinforcing mesh members extending through said panel and disposed closely adjacent each of said surfaces,
a separator member disposed between said reinforcing members and extending along said peripheral edge portion,
a truss-like member interconnected to and between said reinforcing mesh members at a location between said edge portion and said separator member and extending along the extent of and adjacent said edge portion, and
walls extending between said edge portion and said separator member and defining therewith a channel disposed between said opposed surfaces and extending along said peripheral edge,
said reinforcing mesh members each having curved distal ends disposed between said channel-defining walls and projecting outwardly from said separator member and beyond said peripheral edge for connection to another member when said latter member is disposed in said channel.

4,006,571

MOUNTING ASSEMBLY WITH IMPROVED FASTENER

William M. Bursk, Middletown, Ohio, assignor to Pease Company, Fairfield, Ohio

Filed Apr. 30, 1976, Ser. No. 681,793
Int. Cl.² E06B *3/58;* E04F *19/06*
U.S. Cl. 52—498 9 Claims



1. In a mounting assembly for supporting a panel in a receiving opening in a frame, including a pair of complementary molding members each having an outer rim sized to seat on an annular surface area of the frame surrounding the opening in which a panel is to be supported, an inner rim sized to seat on an annular surface area adjacent the periphery of a panel supported in the opening, and an intermediate portion interconnecting said inner and outer rims, the improvement comprising:
opposed, aligned studs projecting from said molding members towards each other,
tubular clip means interconnecting said opposed aligned studs,
said tubular clip means including cylindrical portions receiving said opposed, aligned studs, and wing portions projecting from said cylindrical portions of said clip means for supporting an edge of a panel engaged by said inner rims of said molding members.

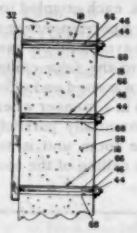
4,006,572

SECURITY FRAME AND MIRROR ASSEMBLY

Earl L. Morris, Whittier, Calif., assignor to Acorn Engineering Company, Industry, Calif.

Filed Nov. 13, 1975, Ser. No. 631,448
Int. Cl.² A47G *1/16;* E04B *1/38*
U.S. Cl. 52—506 14 Claims

1. A security frame and mirror assembly for mounting to a wall, comprising:
a. frame means including a sidewall with a flange thereabout;
b. receptacle means secured directly to the back face of said flange;
c. mirror means adpated to be nested between said receptacle means and the free edge of said flange; and



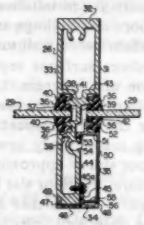
d. anchoring means passed through the mounting wall for securing said receptacle means to said wall, whereby the anchoring means is not accessible, and, consequently, is not removable from the side of the wall to which the frame means, mirror means and receptacle means are mounted.

4,006,573

NARROW FRAME WALL STRUCTURE

Lawrence F. Biebuyck, Dallas, Tex., assignor to Howmet Corporation, New York, N.Y.

Filed Aug. 29, 1975, Ser. No. 608,838
Int. Cl.² E04C *3/32;* E04B *1/48;* E06B *1/04*
U.S. Cl. 52—732 7 Claims



1. A vertical mullion especially adapted for use in a narrow wall framing system comprising:
a mullion base piece which is generally rectangular in cross section with one quadrant of the rectangle omitted, and having a first glazing pocket formed in a long side thereof and one side and the floor of a second opposed glazing pocket formed on the long side whereat the quadrant is omitted;
a mullion stop attached to said mullion base piece at the short side thereof whereat the quadrant is omitted, said mullion stop being proportioned to establish a length for said short side substantially equal to the length of the other short side of the mullion base piece;
and a mullion filler attached to said mullion base piece at the long side thereof whereat the quadrant is omitted, and attached to said mullion stop, said mullion filler having the other wall of said second glazing pocket formed therein.

4,006,574

METHOD OF FORMING A CONSTRUCTION OF BUILDING SUBSTRUCTURES

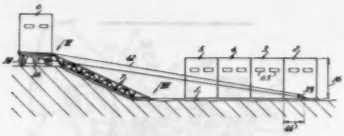
Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

Continuation of Ser. No. 393,023, Aug. 30, 1973, abandoned. This application June 30, 1975, Ser. No. 591,947

Claims priority, application Netherlands, Sept. 1, 1972, 7211909

Int. Cl.² E04B 1/35; E04G 21/00

U.S. Cl. 52—742 23 Claims



1. A method of forming the substructure of a building constructed by being assembled from prefabricated box-shaped elements each having dimensions compatible with being transported on highways by transport vehicles, the method comprising the steps of:

excavating a building site at a desired level below that of the surrounding terrain;

forming a concrete slab in said excavation which has a flat horizontal upper surface and a shape and area which substantially corresponds to the lower portion of the building to be erected;

transporting on a transport vehicle which is provided with winch means, at least one elongated three-dimensional concrete substructure section intended for the substructure of the building to adjacent said excavation whereby the longitudinal axis of said substructure section is substantially parallel to the place it will occupy in the completed building and its shorter ends are substantially in the same plane as they will occupy in the completed building;

providing at least two parallel bridge members directly between and connected to the portion of said transport vehicle carrying said substructure section and said concrete slab;

connecting pulley means adjacent the remote end of said slab on either side of the place said substructure section will occupy in the finished building and providing a pair of flexible members each engaging a separate said pulley with one end of each said flexible member connected to the longer side of said substructure section which is most remote from said concrete slab, the other end of each said flexible member being connected to said winch means;

displacing said substructure section across said bridge members and said concrete slab to its desired place in the building by winding each said flexible member by said winch means;

disengaging said bridge members from said transport vehicle and transporting further concrete substructure sections to substantially the same position described for said first mentioned substructure section and by the same steps heretofore described for displacing said first mentioned substructure, displacing each said further substructure section to its desired position on said slab in the completed building whereby said substructure sections are in an abutting relationship with one another and the substructure of the building is substantially completed.

4,006,575

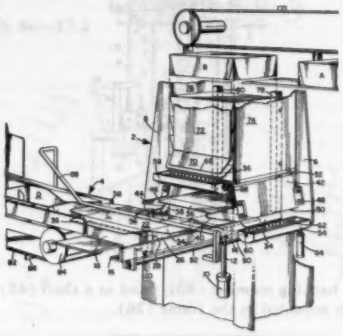
CARTON SEALING MACHINE

Richard G. Lee, Boston, Mass., assignor to Econocorp, Inc., Needham Heights, Mass.

Filed Nov. 4, 1975, Ser. No. 628,739

Int. Cl.² B65B 7/20

U.S. Cl. 53—38 9 Claims



8. The method of treating a succession of cartons whereby the lid of each carton is secured to the carton body in which each said lid has oppositely disposed and extended end flaps and an extended front flap which flaps are to be glued to their respective panels when the lid is closed, said method comprising the steps of

closing the lid of a first carton,

applying glue to the extended end flaps of the lid while the carton is at a first location,

pressing the said end flaps against their respective panels while moving the carton upward to another location,

placing a second carton in said first location with its lid closed and said end and front flaps extended,

simultaneously applying glue to the front flap of said first carton and to the end flaps of said second carton, then moving said first and second cartons simultaneously upward to a third location and said second location respectively while at the same time pressing the front flap of the said first carton against its related panel and pressing the end flaps of said second carton against their related panels,

placing a third carton in said first location with its lid closed and said end and front flaps extended and then repeating the aforesaid steps with respect to the cartons then located in said first and second locations.

4,006,576

APPARATUS FOR PACKAGING FLAT FLEXIBLE WORKPIECES, PARTICULARLY BAGS OR SACKS, IN ENVELOPING BAGS

Konrad Tetenborg, Lengerich, Westphalia, Germany, assignor to Windmoller & Holscher, Lengerich, Westphalia, Germany

Filed Mar. 18, 1976, Ser. No. 668,305

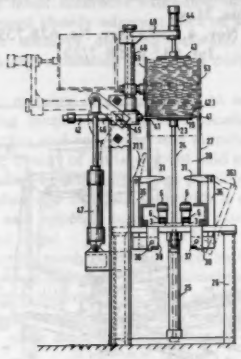
Claims priority, application Germany, Mar. 20, 1975, 2512277

Int. Cl.² B65B 63/02

U.S. Cl. 53—124 B 7 Claims

1. Apparatus for packaging flat flexible workpieces, particularly bags, sacks or packets of sacks, which are stacked in a shaft, in enveloping bags that are inverted over the shaft, comprising a slide reciprocatable in the shaft and a backing member disposed above the shaft, characterised in that the slide consists of supporting bars (19 to 22) of upwardly open U-section steel, and that retaining bars (42.1) are provided at the top of the shaft and insertable therein, the retaining bars being insertable in the U-sections of the supporting bars when

the slide is extended and being, together with their driving and supporting means (42) as well as the supporting means (48,



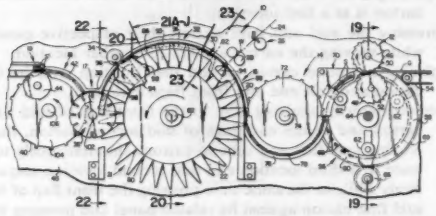
49) of the backing member (43), fixed to a shaft (45) which is pivotably mounted in the frame (26).

4,006,577

GUM STICK WRAPPING MACHINE

Lawrence W. Schoppee, Springfield, Mass., assignor to Package Machinery Company, East Longmeadow, Mass.

Filed June 11, 1975, Ser. No. 586,092
Int. Cl.² B65B *11/36*
U.S. Cl. 53—171 **26 Claims**



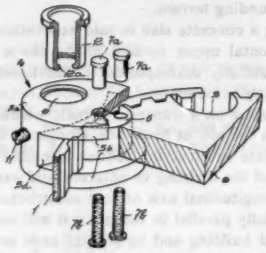
1. A gum stick wrapping machine comprising a gum stick breaker mechanism including a rotary gum stick transfer mechanism for cntinuously conveying gum sticks away from said breaker mechanism, a first rotary folder including means defining an arcuate first folding channel communicating with said rotary stick transfer mechanism for receiving each successive stick therefrom, a first rotary element journalled for continuous rotation relative to said first folding channel and having a series of circumaxially arranged and radially outwardly extending flights for engaging sticks in said channel to continuously convey the sticks therealong, said first folding channel having first folding means for folding an inner wrapper to a generally U-shaped configuration about a stick advancing therein to fold one end portion of the inner wrapper against the lower face of the stick to bring the other end portion of the inner wrapper into trailing relation with the upper face of the stick and the opposite side marginal portions of the inner wrapper into outwardly extending relation to the opposite ends of the stick, second folding means associated with said first folding channel for engaging and folding the side marginal portions of the inner wrapper downwardly relative to the stick and against the opposite ends thereof and tucking the side marginal portions inwardly toward each other and below the lower face of the stick and into trailing relation with the lower face as the partially wrapped stick is advanced within said folding channel by said first rotary element, third folding means associated with said folding channel for engaging the trailing portions of the inner wrapper and folding the trailing portions of the previously folded and tucked side marginal portions upwardly relative to the stick and against the trailing edge of the stick and into face to face engagement with the lower surface of the trailing upper end portion of the inner wrapper as the partially wrapped stick is continuously advanced within said first folding channel by said first rotary element, and drive means for continuously rotating said first rotary element in timed relation to said breaker mechanism and said gum stick transfer mechanism.

4,006,578

CONVEYOR FOR CONVEYING CAPSULES IN MACHINES FOR FILLING SAID CAPSULES WITH DOSES OF PULVERULENT OR GRANULAR PRODUCT

Ernesto Gamberini, via Udine, 6, Bologna, Italy

Filed Oct. 21, 1975, Ser. No. 624,638
Claims priority, application Italy, Nov. 6, 1974, 3515/74
Int. Cl.² B65B *1/04*
U.S. Cl. 53—282 **2 Claims**



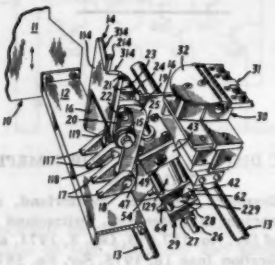
1. Conveyor for conveying capsules composed of a case and cap in machines for filling said capsules with doses of pulverulent or granular product and which comprises an assembly for feeding the capsules in their closed state and incorporating means for separating the case from the cap, a dispensing assembly arranged to insert a predetermined product dose into the capsule case, and a capsule closing assembly, the conveyor comprising a pair of toothed belts of equal length in the form of endless loops and lying in two horizontal planes, the belts being wound about idle pulleys to convey the capsules from the feed assembly to the dispensing assembly and from this latter to the closing assembly, a plurality of blocks supported at equal distances along the belts, each block of the upper belt being provided with a seat for housing the cap of one capsule, and each block of the lower belt being provided with a seat for housing the case of the same capsule, the seats being mutually aligned, at least when in a position corresponding with the capsule feed assembly, to receive the capsule and wherein each of the blocks comprises a first element composed of a member external to the belts and of cylindrical shape, rigid with which there is a species of fork comprising two arms which extend above and below the belt towards the interior of this latter, and a second element fixed between the arms of the fork to clamp the belt against the base of the fork, the second element comprising a peripheral cylindrical surface concentric with that of said member, said member and said second element comprising holes for housing sockets for supporting the capsule cap and case.

4,006,579

AUTOMATIC CARTON CLOSING MACHINE HAVING A THREE-POSITION CARTON STOP PADDLE INCLUDING A SLOPED INTERMEDIATE ONE AS AN UPFOLDED BOTTOM END FLAPS GUIDING RAMP

Winton Loveland, Fort Salonga, N.Y., assignor to The Loveshaw Corporation, Deer Park, N.Y.

Filed Mar. 19, 1976, Ser. No. 668,416
Int. Cl.² B65B 7/20
U.S. Cl. 53—374 10 Claims



1. In an automatic carton closing machine constructed to provide adhesive anchorage of unfolded bottom side flaps to infolded bottom end flaps thereabove of each of successive cartons by partially swinging down the upfolded bottom side flaps to dropped oblique positions for entry into the space above the latter and below the infolded bottom end flaps of an adhesive applicator head located below the carton travel path in a forward section of the machine as the carton is advancing for application of adhesive to areas of the bottom faces of these infolded end flaps for subsequent lap by again folding these bottom side flaps up against them; the combination comprising

1. a stop paddle pivotally mounted on a transverse axis below said forward carton travel path for swing upward and rearward to a substantially upright position from a lower position for serving as a stop gate to be abutted by each oncoming carton so that each such carton is held therebehind until released by said gate as it is retracted, and swing forward and down to a prone lateral position from its upright position and passing down through an intermediate position in which it is oriented obliquely upward and forward for disposition of its top surface as an upwardly sloping ramp for guidance successively of the free trailing end of the front bottom end flap and then the free leading end of the back bottom end flap to the top of the applicator head for ride over the latter; and

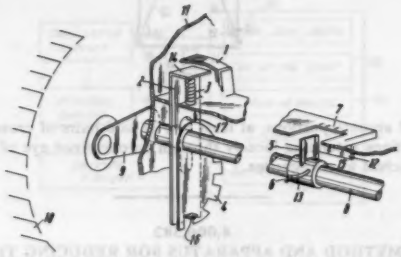
2. means effecting and controlling swing of said stop paddle successively through a cycle of such swinging action during the period from a carton-receptive condition of the machine and the entry of a loaded carton through to abutment of this stop gate and then travel over the adhesive applicator head for subsequent completion of the folding of the carton closing flaps and anchorage thereof, comprising a first swinging action step of raising it from its lower position before arrival of such carton at the vicinity of said gate, a second action step of lowering it to release the carton for further advance of the latter, and a third action step of again raising it just to the intermediate ramp-forming position.

4,006,580

CUTTING HEIGHT ADJUSTING MEANS FOR LAWN-MOWERS

Artur Kalleicher, Kirchen, Sieg, Germany, assignor to Wolf-Gerate GmbH, Gregor-Wolf-Strabe Betzdorf, Sieg, Germany

Filed Apr. 4, 1975, Ser. No. 565,066
Claims priority, application Germany, Apr. 22, 1974, 2419364
Int. Cl.² A01D 55/32
U.S. Cl. 56—17.2 6 Claims



1. Cutting height adjustment means for lawn mowers, wherein the mower comprises;

a chassis, wheels which ride on a running surface; said wheels having an axle about which they rotate, and wherein said adjustment means is for adjusting the height of said wheel axle over the running surface with respect to the height of said chassis;

said adjustment means comprising:

a shaft pivotally connected to said chassis at a fixed location; a crank arm, said crank arm being connected to and supported on said shaft; said crank arm being rotatable with respect to said chassis around said shaft, without shifting of the position of said shaft with respect to said chassis; said axle being carried in said crank arm remote from said connection of said crank arm on said shaft;

detent means secured to said shaft and rotatable therewith; said detent means comprising a plurality of separated detents, each of which, in turn, is movable into a position to be engaged by a latch as said shaft rotates;

a latch that is so secured on said chassis so as to prevent changing the location of said latch on said chassis; said latch comprising an extension engageable in each said detent as it is rotated by said shaft into position to be engaged by said extension, and an operating member secured to said extension and normally fixed, but movable to move said latch extension into and out of engagement with said detents; said operating member being operable to shift said extension out of each said detent, thereby to permit rotation of said shaft, and also being operable to shift said extension into each said detent, thereby to prohibit further rotation of said shaft, said operating member having a bent-over portion, and a return spring disposed between said chassis and said operating member for normally biasing said extension into each detent as each said detent is presented to said extension.

4,006,581

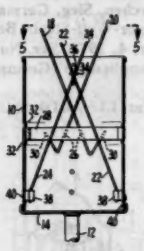
FRUIT PICKING DEVICE

James W. Freeman, San Pablo, Calif., assignor to Sammy Joseph Jackson, San Pablo, Calif., a part interest

Filed July 14, 1975, Ser. No. 595,789
Int. Cl.² A01D 46/24
U.S. Cl. 56—333 4 Claims

1. A fruit picking device comprising a carrier, a pair of piano wire elements having inverted U-shaped forms and residing within intersecting planes, said elements having lower portions connected to the carrier, having upper arcuate por-

tions directed upwardly and away from each other, and having pairs of intermediate cross-over portions below and adjacent



said arcuate portions, at least one of said pairs of cross-over portions extending loosely through an oversized eye of a pin attached to said carrier.

4,006,582

METHOD AND APPARATUS FOR REDUCING THE ELECTRICAL COUPLING IN COMMUNICATING CABLES

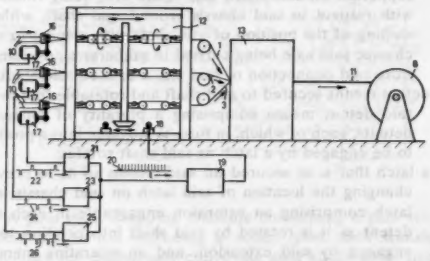
Erdal Gürkaynak; Jürgen Spatz; Dieter Vogelsberg, and Gerhard Liedtke, all of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed July 25, 1974, Ser. No. 491,753

Claims priority, application Germany, Aug. 7, 1973, 2340351

Int. Cl.² H01B *13/04*

U.S. Cl. 57—34 AT **13 Claims**



1. A method for reducing the electric coupling in communications cables by influencing the twisting process in a two-stage twisting of conductors to form twisted units and of twisted units to form a twisted group taking place in the same operation, particularly in the two-stage twisting of conductors to form pairs or quads and of the pairs or quads to form a bundle comprising:

a. forming respective twisted units in which the phase of the conductors is changed such that pairs of sections of opposite phase with the phase sequence remaining the same are formed; and

b. twisting the units so formed into a group in which the changes of the phase of the twisted units adjacent to each other within the twisted group are related to each such that two respective, adjacent twisted units have at least approximately the same number of parallel sections of the same and opposite phase over their entire length.

11. Apparatus for reducing the electrical coupling in communication cables by influencing the twisting process in a two stage twisting of conductors to form twisted units and of twisted units to form a twisted group taking place in a same operation comprising:

a. a twisting nipple for each unit into which the conductors of the respective twisting unit to be formed are led, said nipple arranged between the conductor supplies in the first twisting stage and a second twisting stage;

b. an aperture disk arranged ahead of each twisting nipple and supported for rotation about the twisting axis to control the phase sequence of the conductors; and

c. means to vary the angular position of said disk one of continuously through $360° \times n$ where n is an integer at least equal to one and in step wise intervals of one of 90°, 180° and an odd multiple thereof in one of a constant direction and alternatingly in one and the other direction.

4,006,583

ELECTRONIC DISPLAY DEVICE FOR TIMEPIECE AND THE LIKE

Raymond Vuilleumier, Neuchatel, Switzerland, assignor to Centre Electronique Horloger S.A., Switzerland

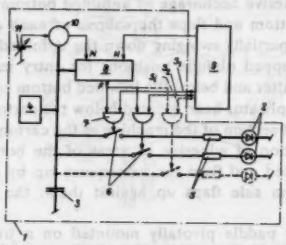
Continuation of Ser. No. 187,613, Oct. 8, 1971, abandoned.

This application June 18, 1975, Ser. No. 587,983

Claims priority, application Switzerland, Oct. 30, 1970, 16170/70

Int. Cl.² G04B *19/32*; G04C *3/00*

U.S. Cl. 58—23 C **15 Claims**



1. In an electronic timepiece display apparatus having a clock circuit for generating a clock signal and a plurality of display signals, each generated display signal corresponding to a desired electroluminescent element to be activated, the improvement comprising: a plurality of electroluminescent display elements; a photovoltaic source generating a voltage as a function of the amount of ambient light irradiating said source;

storage means coupled to said photovoltaic source for storing the output of said photovoltaic source and for producing a voltage in relation to the stored source output;

logic circuit means coupled to said photovoltaic source and to said clock circuit for generating an output signal in the form of a series of pulses which are synchronized with the clock frequency of said clock circuit and width modulated in accordance with the output of said photovoltaic source;

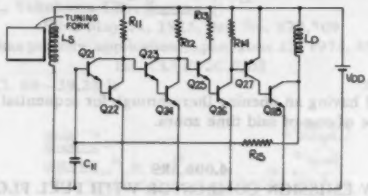
switching means coupled between said storage means and each of said electroluminescent elements; and

means coupling an output of said logic circuit means and the display signal generating portion of said clock circuit to said switching means to activate a particular electroluminescent element by the corresponding display signal appearing at the display signal outputs of said clock circuit coincident with a signal appearing at the output of said logic circuit means.

4,006,584
ELECTRONIC TIMEPIECE

Shingo Hashimoto; Yasuhiko Nishikubo; Heihachiro Ebihara, and Hiroyuki Fukayama, all of Tokyo, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed May 16, 1975, Ser. No. 578,071
Claims priority, application Japan, Nov. 14, 1974, 49-131256
Int. Cl.² G04C 3/00
U.S. Cl. 58—23 A 4 Claims

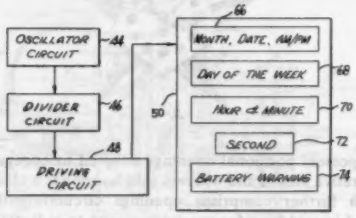


1. An electronic timepiece comprising:
an oscillator of high frequency and substantially stable amplitude;
a mechanical-electrical transducer for picking up signals from the oscillator;
an electronic circuit for amplifying signals from said mechanical-electrical transducer;
an electromechanical transducer for supplying the signals to the oscillator at a vibrations-sustaining energy;
a time display device coupled to said oscillator;
said oscillator, said mechanical-electrical transducer, said electronic circuit and said electromechanical transducer forming a closed loop, said electronic circuit, comprising:
a capacitor; resistors R_{11}, R_{12}, R_{13}, R_{14} and R_{15}; npn bipolar transistors Q_{21}, Q_{23}, Q_{25}, Q_{26}, Q_{25} and Q_{26}; and Q_{28} pnp bipolar transistor Q_{27};
each terminal of said resistor R_{11}, R_{12}, R_{13}, R_{14} is connected, together with the emitter of bipolar transistor Q_7, to a positive voltage terminal of a power source;
in the remaining terminal of said resistors:
R_{11} connects to collectors of transistors Q_{21} and Q_{22} and base of transistor Q_{23},
R_{12} connects to collectors of transistors Q_{23} and Q_{24} and the base of transistor Q_{25},
R_{13} connects to the collector of transistor Q_{25},
R_{14} connects to the collector of transistor Q_{26} and the base of transistor Q_{27};
the emitter of transistor Q_{21} connects to the base of transistor Q_{22},
the emitter of transistor Q_{23} connects to the base of transistor Q_{24},
the emitter of transistor Q_{25} connects to the base of transistor Q_{26},
the collector of transistor Q_{27} connects to the base of transistor Q_{28};
emitters of transistors Q_{22}, Q_{24}, Q_{26} and Q_{28} connect to the minus voltage terminal of the power source;
one terminal of resistor R_{15} and capacitor C_{11} is connected to the base of transistor Q_{21};
the remaining terminal of said resistor R_{15} is connected to the collector of transistor Q_{28};
the remaining terminal of said capacitor C_{11} is connected to said mechanical-electrical transducer; and
one terminal obtained by joining said resistor R_{15} and collector of transistor Q_{28} is connected to said electromechanical transducer.

4,006,585
ELECTRONIC TIMEPIECE WITH ELECTROCHROMIC DISPLAY ELEMENT

Munetaka Tamaru, Tokyo; Kazunari Kume; Minoru Watanabe, both of Tokorozawa, and Hideshi Ohno, Sayama, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Jan. 3, 1975, Ser. No. 538,327
Claims priority, application Japan, Jan. 8, 1974, 49-5498
Int. Cl.² G04B 19/30
U.S. Cl. 58—50 R 5 Claims



1. An electronic timepiece having multi-layered electronic display elements in display functions, said timepiece having an oscillator circuit for producing a constant frequency signal, a divider circuit for dividing said signal of said oscillator circuit, and a driving circuit for decoding said divided signals from said divider circuit, said divider circuit coupled to said display element such that said display elements are activated in response to a signal from said driving circuit, said display elements comprising:
a. a substrate, and substrate made of a transparent material;
a optical conductive electrode disposed on said substrate, said conductive electrode made of a material which enables light to pass therethrough;
c. at least one electrochromic material in contact with said optical conductive layer, said electrochromic material being of the type which has a coloration of a first color when a voltage of a first polarity is applied and of a second color when a voltage of second polarity is applied and which fades to transparent sometime after said voltage is removed;
d. an insulating layer disposed on said electrochromic material such that said electrochromic material is interposed between said insulating layer and said optical conductive electrode; and
e. a reflective electrode disposed on said insulating layer;
wherein said signal from said driving circuit is a pulsating signal and is selectively applied to said display elements such that said display elements remain activated during the time when said signal is applied as well as the time when said signal is not applied thereby reducing power consumption of said timepiece and wherein said pulsating signal from said driver circuit causes said display elements to change from transparent to said first color in response to a pulse of a voltage of a first polarity, to change from said first color to transparent in response to a pulse of voltage of a second polarity, and to change from transparent to said second color in response to a pulse of voltage of said second polarity.

4,006,586
CLOCK HOUSING AND DECORATIVE MEANS THEREFOR

Frank P. Casella, 2404 Freemansburg Ave., Easton, Pa. 18042

Division of Ser. No. 442,324, Feb. 14, 1974, Pat. No. 3,889,806. This application Mar. 18, 1975, Ser. No. 559,489
Int. Cl.² G04B 37/00; B23P 13/00; B65D 85/10, 69/00
U.S. Cl. 58—53 2 Claims

1. A housing comprising a base, a plurality of circumferential tabs extending from the base, the tabs when taken together

substantially extending about the circumference of the base, and said tabs being folded out of the plane of said base to be perpendicular thereto with the individual tabs being positioned against the next adjacent tab, wherein the respective

tabs possess positional openings adapted to engage and hold decorative means and wherein said housing is a clock housing which further comprises openings circumferentially positioned in said base for receiving means to indicate the hours and a medially located opening.

4,006,587

WRIST-WATCH WITH WRISTLET END SECURED TO TOP OF CASE

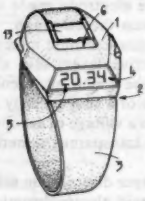
Freddy Huguenin, Lausanne, Switzerland, assignor to Ebauches Electroniques S.A., Neuchatel, Switzerland

Filed Dec. 24, 1975, Ser. No. 644,195

Claims priority, application Switzerland, Jan. 10, 1975, 274/75

Int. Cl.² A44C *5/14*; A45C *11/10*; G04C *3/00*

U.S. Cl. 58—88 R **8 Claims**



1. Wrist-watch having a digital hour display, characterized by the fact that the display device is arranged on one of the lateral faces of the watch-casing, thus leaving its upper face free, the wristlet being secured to the casing by one of its ends and being applied, by its opposite end, onto the said upper face of the casing to which it is secured removably.

4,006,588

WRIST WATCH

Robert J. McMahon, 1105 Brennan Drive, Warminster, Pa. 18976, and Dolores A. Harmer, 1201 Easton Road, Warrington, Pa. 18976

Filed Nov. 19, 1975, Ser. No. 633,391

Int. Cl.² G04B *19/00*

U.S. Cl. 58—126 R **2 Claims**

1. In a watch having an outer case, a transparent crystal, a watch mechanism with a rotary hour output shaft and rotary minute output shaft the improvement which includes

a dial fixedly mounted within said case and provided with numerals for hour indication around the perimeter thereof,

a plurality of differently colored time zones on said dial related to particular periods of time,

minute indicating means driven by said minute output shaft, and

hour indicating means driven by said hour output shaft,

said hour indicating means comprising a rotatable disc in covering relation to said colored time zones on said dial

and having an opening therethrough for sequential exposure of one of said time zones.

4,006,589

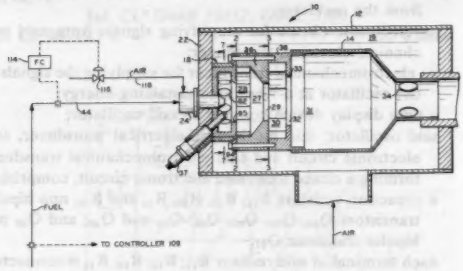
LOW EMISSION COMBUSTOR WITH FUEL FLOW CONTROLLED PRIMARY AIR FLOW AND CIRCUMFERENTIALLY DIRECTED SECONDARY AIR FLOWS

Robert M. Schirmer, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 14, 1975, Ser. No. 567,920

Int. Cl.² F02G *3/00*; F02C *3/00*

U.S. Cl. 60—39.02 **31 Claims**



22. A method for the combustion of a fuel in a combustion zone to produce hot combustion gases having low emissions of NO_x, CO, and HC, said combustion zone having a first upstream combustion region, and a second combustion region located adjacent and downstream from said first combustion region, which method comprises:

introducing a stream of fuel together with a stream of assist air into the upstream end portion of said first combustion region;

introducing a first stream of air at a controlled but variable rate into said upstream end portion of said first combustion region around said fuel;

tangentially introducing a second stream of air into said first combustion region in a circumferential direction and forming a combustible mixture of said fuel and said streams of air;

causing at least partial combustion of said combustible mixture so as to form hot combustion products therefrom;

passing hot combustion products and any remaining said mixture from said first combustion region into said second combustion region;

tangentially introducing a third stream of air into said second combustion region in a circumferential direction around said hot combustion products entering said second combustion region;

controlling said variable rate of introduction of said first stream of air in accordance with the rate of introduction of said fuel; and

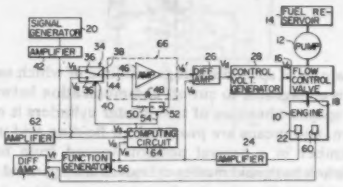
controlling the pressure, or the volume, of said stream of assist air in accordance with the rate of introduction of said fuel.

4,006,590

CONTROL CIRCUIT FOR GAS TURBINE ENGINE

Takane Itoh, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama City, Japan

Filed May 21, 1975, Ser. No. 579,709
Claims priority, application Japan, June 13, 1974, 49-66555
Int. Cl.² F02C 9/08
U.S. Cl. 60—39.28 R **7 Claims**



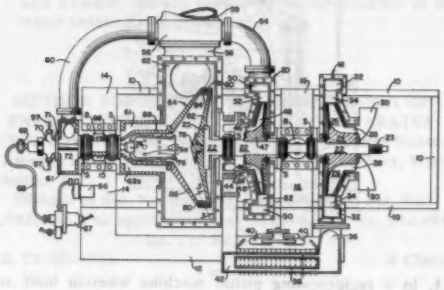
1. A control circuit for controlling output speed of a gas turbine engine, comprising in combination first sensing means for detecting output speed of the gas turbine engine and producing an output signal representative of the detected engine speed, second sensing means for detecting temperature of the engine and producing an output signal representative of the detected engine temperature, first signal generating means for producing an output signal representative of a desired output speed of the engine, second signal generating means responsive to the signals from the first and second sensing means for producing an output signal representative of a difference between the detected engine temperature represented by the output signal from said second sensing means and a predetermined engine temperature varying with the detected output speed of the engine in accordance with a predetermined schedule, first switching means having a first operative condition connected to said first signal generating means and a second operative condition connected to said second signal generating means, an integrating circuit having an input terminal connected to said first and second signal generating means across said first switching means, second switching means connected across the integrating circuit for bypassing the integrating circuit when closed, triggering means having input terminals connected to said first sensing means and said first and second signal generating means for producing a trigger signal responsive to a condition in which the desired engine speed represented by the signal from said first signal generating means is higher than the detected engine speed represented by the output signal from said first sensing means by a value which is related to the detected engine speed and the detected engine temperature, said first switching means being connected to said triggering means for being held in said first operative condition in the absence of the trigger signal from said triggering means and shifted to said second operative condition in the presence of the trigger signal from the triggering means, said second switching means being connected to said triggering means for being held closed in the absence of the trigger signal from the triggering means and open in the presence of the trigger signal from the triggering means, and comparing means having a first input terminal connected in parallel to said integrating circuit and said second switching means and a second input terminal connected to said first sensing means for producing an engine speed control signal representative of a difference between the signals appearing at the first and second input terminals thereof.

4,006,591

JET REACTION TURBINE WITH ROTATING COMBUSTOR FOR BURNING SLURRY FUELS

Kenneth G. Cervenka, Billings, Mont., assignor to Faith Industries, Inc., Billings, Mont.

Filed Aug. 11, 1975, Ser. No. 603,883
Int. Cl.² F02C 3/14, 3/26
U.S. Cl. 60—39.35 **6 Claims**



1. A reaction turbine for burning solid particulate fuels in slurry form delivered to the turbine from a fuel pressure regulator, and for discharging the resulting ash from the turbine to prevent accumulation therein, comprising:

a. a frame having axially spaced journal supports and having a shaft journaled therein and supporting rotary air compressor means delivering air under pressure to an air intake housing adjacent one of the journal supports;

b. a fuel burning rotor having an annular peripheral portion and having a first-end portion extending radially outwardly from the shaft to the peripheral portion, and having a second end portion fixed to the peripheral portion and having a central opening therethrough, the diameter of said peripheral portion being large as compared with the axial length of the rotor between said end portions;

c. an annular series of jet orifices extending through said annular portion and spaced thereabout and each oriented substantially normal to a radius of the rotor intersecting the orifice;

d. a chamber housing having one end fixed to said second end portion and communicating smoothly into said rotor thereat, and having its other end supported by journals at said one journal support and communicating with said air intake housing to receive compressed air;

e. a fuel injector connected with said regulator and extending through said intake housing and axially through said other end of the chamber housing and having a nozzle facing into the housing operative to spray fuel thereinto;

f. a combustion chamber sleeve in said chamber housing mounted concentrically therein in spaced relationship to the chamber housing and supported to rotate therewith, the combustion chamber sleeve being longer than its diameter and terminating at one end which is necked down to closely fit around the nozzle while leaving an airspace therebetween, and the other end of the sleeve being Venturi shaped and extending beyond said second end portion and flairing into the rotor; the intake air being divided so that a smaller portion of it passes into the sleeve through said airspace and a larger portion of it passes into the rotor by passing between the sleeve and the chamber housing; and

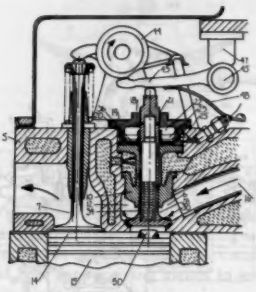
g. a solid particle fuel in slurry form, and means to ignite the fuel sprayed from the nozzle.

4,006,592

VALVE ARRANGEMENTS FOR RECIPROCATING PISTON MACHINES

Glenn B. Warren, 1361 Myron St., Schenectady, N.Y. 12309

Filed Nov. 17, 1975, Ser. No. 632,313
Int. Cl.² F02G 3/02
U.S. Cl. 60—39.63 **8 Claims**



1. In a reciprocating piston machine wherein inlet and discharge valve means control the flow of fluid into and out of a working cylinder of said machine in a desired timed sequence, the combination with said machine of an improved inlet valve arrangement comprising:

a. an inlet valve having a head and a stem extending therefrom;

b. a housing defining an enclosed cavity adjacent said cylinder and surrounding said valve stem;

c. an annular plate carried by said valve stem within said enclosed cavity and near the bottom thereof, said annular plate having a diameter smaller than the inside diameter of said cavity and defining a metering passage therewith and a space between said annular plate and the bottom of said cavity;

d. means for actuating said inlet valve to its open position in a direction away from said cylinder, said means including pressure producing means comprising said working piston as it approaches its top dead center position in conjunction with preselected early closing of said discharge valve means so that the pressure produced above said piston and applied to the head and stem of said valve is operative to actuate said valve to the open position; and

e. control means operatively associated with said inlet valve for actuating said inlet valve to its closed position, said control means comprising a rotary cam means driven in timed relationship with said machine and a pivotally mounted rocker arm means operatively associated with said cam means.

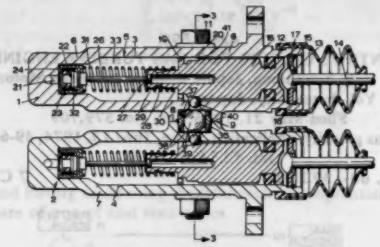
4,006,593

MASTER CYLINDER ASSEMBLY FOR A VEHICLE HYDRAULIC BRAKING SYSTEM

Roy Ernest Edwards, West Midlands, England, assignor to Girling Limited, Birmingham, England

Filed June 5, 1975, Ser. No. 584,045
Claims priority, application United Kingdom, June 8, 1974, 25543/74
Int. Cl.² F15B 7/08
U.S. Cl. 60—581 **5 Claims**

1. A master cylinder assembly for a vehicle hydraulic braking system comprising a pair of master cylinders, each comprising a cylinder, and a piston working in said cylinder and movable between a retracted position and an advanced position in advance of said retracted position and in which hydraulic fluid in a pressure space in said cylinder in advance of said piston is pressurised, and said master cylinder assembly incorporates a fluid flow transfer passage connecting said pressure spaces and through which said pressure spaces communicate when both said master cylinders are operated simultaneously, and transfer valve means are located in said transfer passage to cut-off communication between said pressure spaces when one of said master cylinders is operated on its own, wherein said transfer valve means comprises an unsprung valve member, and a pair of spaced seatings with one of which said valve member is engageable to cut-off communication between said pressure spaces when one of said master cylinders is operated on its own, and means are provided for holding said unsprung valve member in a neutral position spaced from both said seatings when both said master cylinders are operated simultaneously.

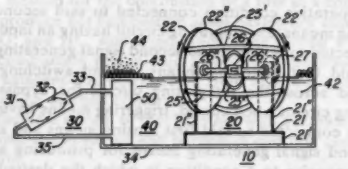


4,006,594

SOLAR POWER PLANT

Paul F. Horton, 9393 Hackamore Drive, Boise, Idaho 83705

Filed May 12, 1975, Ser. No. 576,811
Int. Cl.² F03G 7/02
U.S. Cl. 60—641 **11 Claims**



1. Apparatus for converting solar heat energy into mechanical energy which comprises:

a converter unit, said converter unit including

a frame;

a pair of wheels rotatably mounted on said frame and set at a selected angle one to the other so that a linear force developed between corresponding points on each of said wheels will cause rotation thereof;

a plurality of continuously driving expansile-contractile members for producing the linear force, movably mounted on and between said wheels;

means for governing the position of each of said wheels relative to one another so that said wheels rotate as a unit;

means for collecting solar heat; and

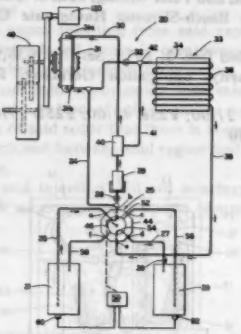
means for selectively applying the solar heat so collected to said expansile-contractile members so that a hot sink and a cold sink are thereby created.

4,006,595

REFRIGERANT-POWERED ENGINE

William J. Forbes, Cocoa, Fla., assignor to Orange State, Inc., Cocoa, Fla.

Filed Dec. 30, 1975, Ser. No. 645,396
Int. Cl.² F01K 25/10
U.S. Cl. 60—651 32 Claims



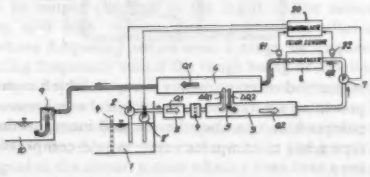
1. A power system comprising first and second tank means for liquid refrigerant; means for heating the refrigerant to produce super-heated vapor; means for transferring refrigerant selectively from said first and second tank means to said heating means; engine means for converting energy of the super-heated vapor into motive power; means for condensing the super-heated vapor; means associated with said first and second tank means for detecting a low level of refrigerant contained herein; and valve means for forming (1) a first flow of refrigerant along a first closed fluid flow path from said first tank means to said second tank means and including respectively said heating means, said engine means, and said condensing means, and (2) a second flow of refrigerant along a second closed fluid flow path from said second tank means to said first tank means and including respectively said heating means, said engine means and said condensing means; said valve means being controlled to provide alternatively (1) or (2) in response to an output of said refrigerant detecting means.

4,006,596

COOLING-WATER SUPPLY SYSTEM WITH SELF-ADJUSTING HYDRAULICS

Sándor Mikolics; Károly Ziegler, and Viktor Homola, all of Budapest, Hungary, assignors to Novex Talalmanyfejlesztö es Ertekesitö Külkereskedelmi Rt., Budapest, Hungary

Continuation-in-part of Ser. No. 488,773, July 15, 1974, Pat. No. 3,927,531. This application Dec. 18, 1975, Ser. No. 642,193
Claims priority, application Hungary, July 25, 1973, MI 541
Int. Cl.² F01K 9/00
U.S. Cl. 60—690 4 Claims



1. A method of operating a cooling-supply system for the condenser of a power plant which comprises the steps of:

pumping cooling water from a source through a cooling-water channel at a first location;

pumping water from said channel at a second location through said condenser and through a warm-water channel;

collecting water from said warm-water channel in a reservoir;

maintaining the level of water in said reservoir substantially constant;

bypassing said channels into one another; and

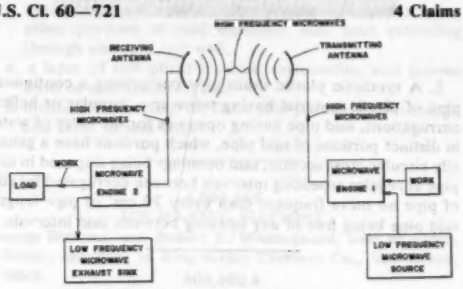
controlling the flow of water from one channel into the other at the bypass solely by the relative rates pumped at said location, thereby regulating the temperature of the water entering said condenser.

4,006,597

METHOD FOR MICROWAVE TRANSMISSION OF ENERGY WITH SUPERCONDUCTING APPARATUS

G. John Dick, Pasadena, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 606,160, Aug. 20, 1975, Pat. No. 3,983,470. This application June 3, 1976, Ser. No. 692,401
Int. Cl.² F03G 7/00
U.S. Cl. 60—721 4 Claims



1. A method of transmitting energy in the form of microwaves comprising:

a. converting work and microwaves having an initial energy level into microwaves having an energy level higher than said initial energy level at a superconducting temperature at a first location;

b. transmitting said microwaves having said higher energy level from said first location to a second location;

c. receiving said microwaves having said higher energy level at said second location; and

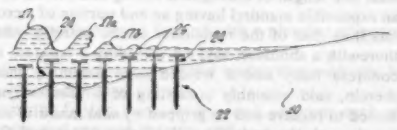
d. rectifying said microwaves having said higher energy level into useful work at a superconducting temperature at said second location.

4,006,598

BREAKWATER SYSTEM

Jobst Hulsemann, 1041 Avenida Amantea, La Jolla, Calif. 92037

Filed Nov. 24, 1975, Ser. No. 634,939
Int. Cl.² E02B 3/04
U.S. Cl. 61—3 12 Claims



1. An off-shore breakwater structure for damping the energy of incoming waves to prevent damage and erosion along a shoreline comprising an array of separate, unconnected, rigid, non-buoyant, stationary, disc-shaped, horizontal, spaced-apart platforms each supported above the natural sea

floor by a single, centered, vertical pile, said platforms being arranged according to a predetermined regular pattern such that the area of the platforms covers between about 50 and 80 percent of the area of the array, thereby forming a false sea floor that induces early cresting of waves while equalizing the water pressure above and below said false sea floor.

4,006,599

PLASTIC DRAIN PIPE AND APPARATUS FOR PRODUCING THE SAME

Wilhelm Hegler, and Ralph-Peter Hegler, both of Goethe Strasse 2, 873 Bad Kissingen, Germany

Filed Mar. 4, 1975, Ser. No. 555,325

Claims priority, application Germany, June 20, 1974, 2429718

Int. Cl.² E02B *11/00*; F16L *1/00*

U.S. Cl. 61—11 **16 Claims**

1. A synthetic plastic drain pipe comprising a continuous pipe of plastic material having transverse, annular or helical corrugations, said pipe having openings for the entry of water in distinct portions of said pipe, which portions have a generally circular cross section, said openings being disposed in said pipe at regular repeating intervals between corrugated lengths of pipe no more frequent than every 20 cm. of pipe length, said pipe being free of any opening between said intervals.

4,006,600

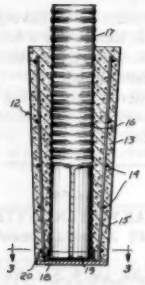
TAPERED PILE TIPS

Charles L. Guild, 7 Stone Tower Land, Barrington, R.I. 02806

Filed Nov. 6, 1975, Ser. No. 629,508

Int. Cl.² E02D *5/72*

U.S. Cl. 61—53 **6 Claims**



1. A tip for attachment to a pile of the type consisting of at least one length of corrugated tubing and driven by means of an expansible mandrel having an end portion of a cross section less than that of the remainder of the mandrel and defining therewith a shoulder, said tip including a tapered, reinforced concrete body and a welded core assembly incorporated therein, said assembly consisting of a tubular core dimensioned to receive and be gripped by said mandrel and extending through the body from the larger upper end thereof and including a tubular member exposed at the upper end of the body and dimensioned to enable a length of said tubing to be welded thereto, a member welded to the reinforcement of the body and including a seat at the lower end of the tip engageable by the mandrel and a tubular portion receiving and welded to the lower end of the core, and a blunt point having at its upper portion of the size and shape of said lower tip end, said blunt point of an area less than the cross sectional area of the core and means detachably attaching the point to the tip.

4,006,601

REFRIGERATING DEVICE

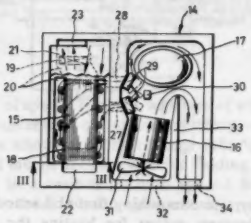
Jürgen Ballarin, and Peter Mattig, both of Giengen, Germany, assignors to Bosch-Siemens Hausgerate GmbH, Munich, Germany

Filed Dec. 2, 1975, Ser. No. 636,944

Claims priority, application Germany, Dec. 13, 1974, 2458981

Int. Cl.² F25D *21/00*; F25B *47/00*; F25D *17/06*; F25B *41/00*

U.S. Cl. 62—80 **17 Claims**



1. A method of operating a refrigerator having a compartment to be cooled, and an evaporator, said method comprising the steps of: circulating air in a closed cooling stream through said compartment and over one side of said evaporator; periodically circulating air at a temperature above 10° C in a defrosting stream over the other side of said evaporator; and separating said streams at all times and preventing air from said cooling stream from mixing with air from said defrosting stream.

4,006,602

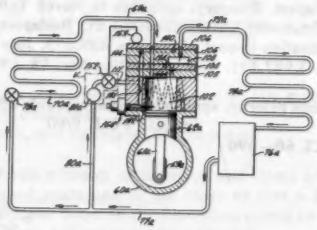
REFRIGERATION APPARATUS AND METHOD

Ralph Z. Fanberg, 6908 Airway Ave., Yucca Valley, Calif. 92284

Continuation-in-part of Ser. No. 494,538, Aug. 5, 1974, abandoned, which is a continuation of Ser. No. 329,548, Feb. 5, 1973, abandoned. This application Jan. 6, 1975, Ser. No. 538,898

Int. Cl.² F25B *41/04*

U.S. Cl. 62—113 **32 Claims**



1. A method of compressing a vapor, which comprises:

a. providing a rotary-vane mechanical compressor having a compression chamber therein and incorporating a vane-type rotor to compress vapor in said compression chamber,

b. introducing a vapor into the intake of said compressor for compression in said compression chamber and subsequent discharge out the outlet of said compressor,

c. supplying to the vicinity of said compression chamber a liquid corresponding to said vapor,

d. effecting vaporization of said liquid while the vaporizing liquid is in heat-exchange relationship with said compression chamber but is not contained in said compression chamber,

whereby the latent heat of vaporization of said vaporizing liquid is employed to cool said compression chamber and compensate for the heat generated due to compression of said vapor introduced into said compressor intake, and

e. mixing the vapor resulting from said vaporization with said vapor introduced into said compressor intake,

said mixing being performed by injecting said vapor resulting from said vaporization into said compression chamber at a region of said chamber so correlated to the vanes of said rotor that there is always at least one vane interposed between said region and said compressor intake,

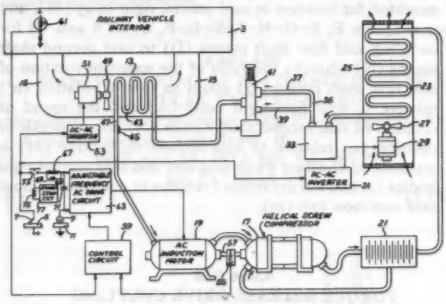
whereby said injection will not interfere substantially with the suction present at said compressor intake.

4,006,603

AIR CONDITIONING SYSTEM FOR A RAILWAY VEHICLE

Marshall Miles, Hollywood, Fla., assignor to Vapor Corporation, Chicago, Ill.

Filed June 13, 1975, Ser. No. 586,496
Int. Cl.² F25B 27/00
U.S. Cl. 62—229 **4 Claims**



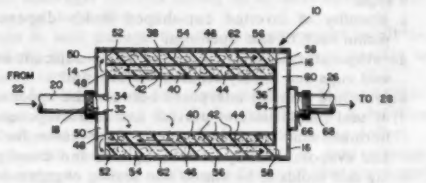
1. In an air-conditioning system for a railway vehicle which is operable from power lines carrying high voltage direct current, a variable speed helical screw refrigeration compressor connected in the system so that the cooling output of the system is continuously modulated by changes in speed of the compressor, and an a-c induction motor connected to said helical screw refrigeration compressor for driving the same, said motor being capable of operating over a range of speeds, the operating speed within said range being determined by the frequency of the input signal to said motor, a solid state circuit means having its input adapted to be connected to the power lines and its output coupled to the input of the motor for converting said high voltage direct current to alternating current whose frequency varies over a range of frequencies, the operating frequency within the range being determined by a control signal applied to said circuit means, and temperature sensing means for sensing the temperature within the railway vehicle and for controlling the compressor speed as a function of variations in the temperature in the vehicle and providing a control signal to the circuit means which varies over a range of values, the value of the control signal within the range being determined by the cooling demand of said railway vehicle, whereby the helical screw compressor speed is continuously modulated in response to variations in the temperature of the vehicle.

4,006,604

AIR CONDITIONED PILLOW

David Seff, New York, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Jan. 23, 1976, Ser. No. 651,649
Int. Cl.² F25D 23/12
U.S. Cl. 62—261 **8 Claims**



1. A cooling device comprising:

a. an enclosure having thin flexible airtight walls;

b. an air inlet in a wall at one section of said enclosure;

c. an air outlet in a wall at another section of said enclosure;

d. an inner air chamber within said enclosure having flexible airtight end walls and flexible porous walls surrounding other portions of said chamber, said inlet extending through one said end wall;

e. a layer of soft pliant material surrounding said porous walls of said chamber, and

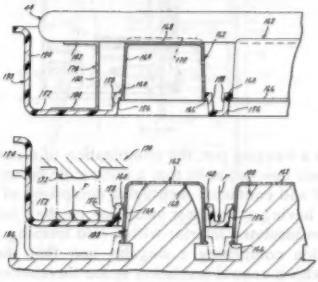
f. means for directing air from said porous walls through said layer to said outlet.

4,006,605

ICE MAKING MACHINE

George Dickson, and Robert K. Westergaard, both of Alden, Minn., assignors to King-Seeley Thermos Co., Ann Arbor, Mich.

Filed June 16, 1975, Ser. No. 587,531
Int. Cl.² F25C 1/04
U.S. Cl. 62—356 **16 Claims**



1. A combination evaporator and platen subassembly for an ice making machine,

said subassembly comprising a platen member having a bottom portion and an upstanding peripheral wall portion,

said bottom portion being formed with a plurality of openings,

a plurality of inverted cup-shaped molds disposed one in each of said openings,

an evaporator having portions arranged adjacent each of said cups and secured thereto, and

means for urging said cups into positive sealing engagement with the peripheral portions of said openings,

said last mentioned means including means disposed between said evaporator and said platen member and normally exerting a force urging said evaporator away from

said platen bottom portion and thereby causing said sealing engagement between said cups and said platen.

8. A combination evaporator, platen and ice mold comprising,

a platen member having a bottom portion and an upstanding peripheral wall portion,

said bottom portion being formed with a plurality of openings,

a plurality of inverted cup-shaped molds disposed one within each of said openings,

an evaporator having portions arranged adjacent each of said cups and fixedly secured thereto, and

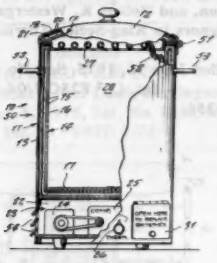
at least one member interposed between the upper surface of said platen bottom portion and said evaporator and normally maintained in a state of compression for urging said evaporator away from said platen and thereby causing said molds to be biased into sealing engagement with said platen openings.

4,006,606

FREEZING POT

Joyce Underdue, 184 Hollywood Ave., East Orange, N.J. 07018

Filed June 2, 1975, Ser. No. 582,733
Int. Cl.² F25D *19/00, 3/08*
U.S. Cl. 62—449 1 Claim



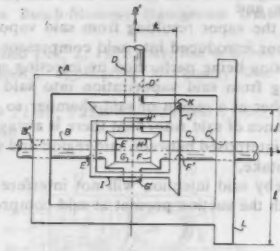
1. In a freezing pot, the combination of a container having an access opening at its top, a removable lid on said opening, said lid and container each being comprised of a metal outer sheath having a fibreglass insulation on their inner sides so to form an insulated interior within said freezing pot, each said insulation comprising a singular unit that includes double walls with a central insulation space therebetween, said container insulation extending around the side and bottom of said container, a resilient rubber pad placed on top said insulation bottom so to cushion the placement of items downwardly into said container, a plurality of carrying handles on an outer side of said container, a compartment below said container containing a refrigeration mechanism including an electric motor driving a compressor, an evaporator and other conventional refrigeration components, and electic power means to said motor, said lid being hingedly connected to said container, a cooling coils of said mechanism being located on an underside of said lid, a horizontal member, integral with said lid sheath, is on an underside of said coil and being provided with openings therethrough for allowing cooled air from said coil flow downward into said container interior, and a flexible hose extending between said coil and a remainder of said mechanism in said compartment below said container, said hose comprising a steel-woven mesh imbedded within a rubber casing.

4,006,607

CONSTANT SPEED RATIO COUPLING FOR SHAFTS WITH TIME-VARYING ORIENTATIONS

Thomas R. Kane, 817 Lathrop Drive, Stanford, Calif. 94305

Filed Aug. 20, 1975, Ser. No. 606,117
Int. Cl.² F16D *3/30*
U.S. Cl. 64—21 5 Claims



1. A shaft coupling comprising:

a first rigid body (A);

a second rigid body (M);

means (shafts B and C) for rotatably coupling said first and said second rigid bodies (A and M) such that said bodies are rotatable relative to each other about a common axis (m);

a first shaft means (D) having an axis of rotation (n′) mounted for rotation in said first rigid body (A);

a second shaft means (N) having an axis of rotation (n) mounted for rotation in said second rigid body (M); and

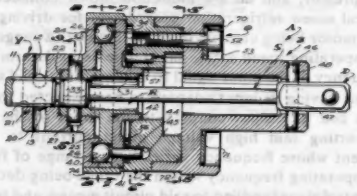
means (gears E, F, G, H, J, K, L, P, Q, R, S and T) for coupling said first shaft means (D) to said second shaft means (N) whereby the ratio of the speed of rotation of said first shaft means (D) about its axis of rotation (n′) relative to said first rigid body (A) and the speed of rotation of said second shaft means (N) about its axis of rotation (n) relative to said second rigid body (M) is maintained constant when said first and said second rigid bodies (A and M) are rotated relative to each other about said common axis (m).

4,006,608

TORQUE RELEASE DRIVE COUPLING

Ivan N. Vuceta, San Gabriel, Calif., assignor to Consolidated Devices, Inc., City of Industry, Calif.

Filed Nov. 3, 1975, Ser. No. 628,393
Int. Cl.² F16D *3/56*
U.S. Cl. 64—29 7 Claims



1. An elongate torque limiting device with front and rear ends and engageable with and between a rotating power shaft and piece of work to be torqued and including a rotatable drive section with a rear portion connected with the power shaft and a front portion with a plurality of circumferentially spaced forwardly opening ball receiving sockets in radial outward spaced relationship from the central longitudinal axis of the device, a driven plate forward of the front portion of the

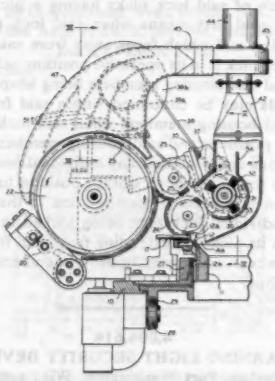
drive section and having axially extending through openings normally registered with said sockets, drive balls normally engaged in and extending between the said openings and sockets and establishing driving engagement between the drive section and driven plate, an elongate central torque shaft with a rear end coupled with the driven plate and a front end connected with a work engaging drive member, a keeper plate forward of the driven plate normally overlying the said openings and holding the balls engaged in said openings and sockets and having rearwardly opening pockets normally circumferentially offset from said openings, a body section forward of the keeper plate, means connecting the body section in predetermined rotative position relative to the front end of the torque shaft, spring means normally yieldingly maintaining the keeper plate in a normal rotative position relative to the body section, said pockets being circumferentially offset from said openings a distance equal to the circumferential deflection of the torque shaft between its front and rear ends upon the conducting of predetermined torque therethrough, said drive section urging the balls forwardly from within the sockets and into the pockets when the pockets move into register with the openings whereby drive between the drive section and driven plate is broken and drive between the driven plate and keeper plate is established, said spring means and keeper plate yieldingly urge the balls rearwardly from within the pockets and into said sockets when the balls are engaged in said sockets and said openings register with the sockets, said connecting means includes a front section drivingly coupled with the torque shaft and engaged with the body section for rotation relative thereto and releasable means securing the body and front section against relative rotation with said pockets in normal predetermined circumferential spaced relationship relative to said openings.

4,006,609

MANUFACTURING OF PATTERNED DEEP PILE CIRCULAR KNITTED FABRIC

Norman C. Abler, Menominee Falls, Wis., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Apr. 29, 1974, Ser. No. 465,269
Int. Cl.² D04B 9/14
U.S. Cl. 66—9 B **17 Claims**



1. In apparatus for manufacturing patterned deep pile circular knitted fabric, including means defining a fiber feed path in which fibers are transferred to the clothing of a doffer rotating in one direction, and knitting needles carried by a rotary cylinder, said needles being adapted to selectively take part of said transferred fibers from the doffer clothing but allowing some of the fibers to remain on the doffer clothing, the improvement comprising:

a scavenger roll for continuously scavenging from the doffer clothing fibers remaining nonuniformly on the doffer clothing in the area thereof between where the knitting needles may take fibers from the doffer and where the fibers are transferred to the doffer;

means defining a pneumatic passage leading away from said scavenger roll and having hood means partially enclosing the scavenger roll and having an air inlet opening adjacent to the doffer;

means in said passage for effecting movement of air inwardly through said opening and along said passage to carry away the scavenged fibers;

means for discharging the scavenged fibers from said passage and delivering the discharged fibers to a location along said fiber feed path for retransfer to the doffer;

mechanical dispersing means located in said passage whereby to assure uniform delivery of the scavenged fibers to said location;

said means defining a fiber feed path including a carding roll; and

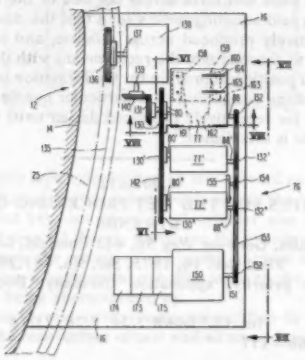
said discharging and delivering means comprising a hood having means defining a discharge opening complementary to a substantial peripheral area of the carding roll and directed to discharge the scavenged fibers onto the periphery of the carding roll.

4,006,610

METHOD AND APPARATUS FOR FEEDING PLURAL SLIVERS SELECTIVELY TO A HIGH PILE FABRIC KNITTING MACHINE

Thomas J. Thore, Tarboro, N.C., assignor to Glenolt Mills, Inc., New York, N.Y.

Filed June 10, 1975, Ser. No. 585,473
Int. Cl.² D04B 9/14
U.S. Cl. 66—9 B **12 Claims**



1. In a sliver feeding device for a high pile fabric circular knitting machine, said device having a main cylinder, plural assemblies of rotatable sliver feed rolls spaced arcuately about the cylinder, sliver feed control means for activating the feed rolls during selected time inervals to deliver sliver selectively to the cylinder, said control means including a separate timing control device and a separate drive means associated with each assembly of feed rolls for rotating selectively the feed rolls to deliver sliver to the cylinder, each said drive means being connected electrically to the timing control device for its feed rolls, the improvement wherein each separate timing control device includes:

a. a cam-switch assembly connected electrically to the drive means, said cam-switch assembly including a rotatable timing cam for actuating the switch selectively,

b. drive means to rotate the timing cam continuously and

c. control means for the timing cam to adjust the cam position continuously as the cam rotates relative to its switch,

to vary selectively the points in time when the time intervals commence and cease, and the duration of the time intervals, during which the feed rolls deliver sliver to the cylinder.

4,006,611

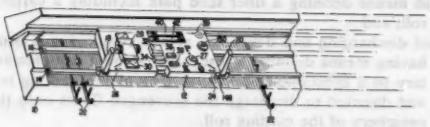
POSITIONING CONTROL FOR PROGRAMMABLE KNITTING MACHINES

William Kahan, New York, N.Y.; Howard D. Rogers, Fanwood, and Fredrick A. Rupinski, Lyndhurst, both of N.J., assignors to The Singer Company, New York, N.Y.

Continuation-in-part of Ser. No. 612,815, Sept. 12, 1975, Pat. No. 3,983,718. This application June 24, 1976, Ser. No. 699,734

Int. Cl.² D04B *7/00, 15/66*

U.S. Cl. 66—75.2 **5 Claims**



1. In a knitting machine, the combination comprising a needle bed supporting a plurality of needles in side by side relation, a carriage mounted on the bed for movement traversing such needles, a program card bearing patterning instructions in rows and columns to denote a design unit to be produced in courses and wales respectively of a fabric, means for reading out the patterning instructions on the card, a memory connected with the reading means for storing signals representing the patterning instructions, needle selecting means on the carriage operably connected with the memory, means for sequentially recalling signals from the memory as the carriage is moved back and forth across the bed of the machine and operating said selecting means such that the design unit may be repetitively produced across a fabric, and switch means operable to precondition the recall means with the carriage in a selected position to provide for the formation of a particular column of the design unit on a particular needle whereby the locations for repetitively produced design units in a width of said fabric is established.

4,006,612

APPARATUS FOR THE WET PROCESSING OF TEXTILE STRANDS

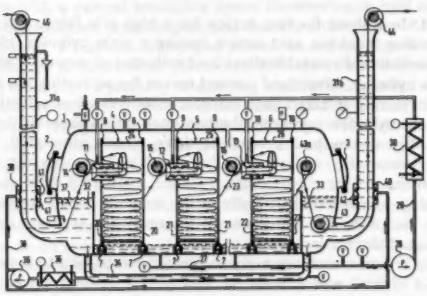
Alfred Thies, Gerlever Weg 56, 442 Coesfeld, Germany

Filed Dec. 16, 1975, Ser. No. 641,262

Claims priority, application Germany, Dec. 16, 1974, 2459363

Int. Cl.² D06B *3/24, 3/28, 23/18*

U.S. Cl. 68—177 **12 Claims**



1. An apparatus for the wet processing of an elongated flat-shaped textile strand in a processing liquor comprising

a kier capable of accommodating a long length of the textile strand;

at least two drums inside said kier, each of said drums having an annular wall and end walls;

jetting-in means associated with each of said drums for inserting said strand into its associated drum;

means in said kier radially displaced from the central axis of said drums for engaging and rotatably supporting said drums for rotation about said central axis;

means cooperating with said drums and said jetting-in means for establishing a predetermined path of travel in said kier from one drum to another in a series sequence; and

circulating system means including a pump for recirculating said processing liquor under pressure to said jetting-in means and from the bottom of said kier;

the end walls of said drums having means defining central openings to permit insertion and withdrawal of said strand, said central openings being dimensioned to avoid conflict with said jetting-in means and said strand.

4,006,613

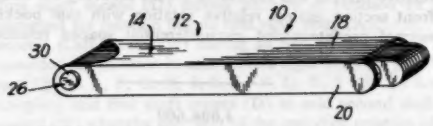
LOCK PICK MECHANISM

Westley Zion, New York, N.Y., assignor to Majestic Lock Co., Inc., New York, N.Y.

Filed Feb. 11, 1976, Ser. No. 657,193

Int. Cl.² E05B *19/20;* **A47G** *29/10*

U.S. Cl. 70—394 **9 Claims**



1. A lock pick mechanism comprising first and second housing members, first means for connecting said housing members together for pivotal movement between open and closed positions, a frame secured at one end thereof to said first means, a plurality of lock picks, second means disposed at the other end of said frame for connecting said lock picks together for pivotal movement between storage and operative positions, each of said lock picks having a pick end which faces toward said first means when said lock pick is in its storage position and which faces away from said first means when said lock pick is in its operative position, said plurality of lock picks and said housing members being adapted such that said pick ends may be contained within said frame and enclosed by said housing members when said lock picks are in their storage positions and said housing members are in their closed positions and such that any individual one of said lock picks may be rotated from its storage position to its operative position when said housing members are in their open positions, said individual lock pick being locked in its operative position with its pick end extending from said frame and said housing members when said housing members are in their closed positions.

4,006,614

WARNING LIGHT SECURITY DEVICE

Wilton K. Decker, Port Washington, Wis., assignor to Safe-Lite, Inc., Menomonee Falls, Wis.

Filed Aug. 21, 1975, Ser. No. 606,700

Int. Cl.² E05B *9/04, 65/52*

U.S. Cl. 70—63 **10 Claims**

1. In combination with a housing for a warning light of the type wherein a removable casing is pivotally connected at one end to a base, and wherein the casing has an aperture at its opposite end which aligns with an opening in the base, wherein the improvement comprises:

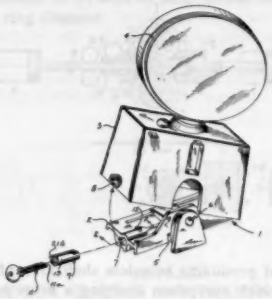
a key;

a plug-type lock which is received by the opening in said base and the aperture in said casing to prevent relative movement therebetween while disposed therein, said lock having:

a lock housing having an interior which receives said key;

a locking cylinder rotatable within said lock housing having a radially extending latch element, and a key receiving slot at one end that faces axially into said lock housing;

said latch element extending radially outwardly from the interior of said lock housing, and being movable between locking and non-locking positions upon actuation by said



key, the locking position restraining and the non-locking position allowing removal of said lock from said base and said casing;

a key receptor rotatable within said lock housing having an axial key receiving channel, and that turns with said locking cylinder upon insertion and rotation of said key; and

an arched key restrainer within said lock housing and disposed axially between said locking cylinder and said key receptor presenting a ridge lying in a transverse plane adapted to match a key notch upon insertion and turning a proper key.

4,006,615

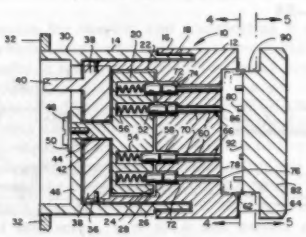
AXIAL TUMBLER LOCK

Janos Szova, 3615 Greystone Ave., Bronx, N.Y. 10463

Filed Aug. 7, 1975, Ser. No. 602,586

Int. Cl.² E05B 27/08

U.S. Cl. 70—363 **9 Claims**



1. An axial tumbler lock comprising a body portion including a casing member having a plurality of axial bores extending therethrough and exposed at the forward surface thereof, a cylinder member mounted within the rear portion of said casing member with one of said members being fixed to a stationary support and the other member being rotatable relative thereto, said cylinder member having a forward surface forming a shear plane with a confronting rear surface of said casing member and having a plurality of axial bores each aligned with a corresponding bore of said casing member, latch means operatively connected to said rotatable member for movement to a lock-open position when said rotatable member is rotated relative to said fixed member, a plurality of axial tumbler means movably mounted, one each, in selected bores of said plurality of bores, each of said tumbler means comprising a lock pin slidably mounted in a respective bore of said cylinder member, a tumbler pin slidably mounted in a respective bore of said casing member and a compression spring within said cylinder member bore normally urging said lock pin to a locked position in which it extends across said shear plane between said members, thus preventing rotation of said rotatable member relative to said fixed member, said tumbler pins having varying lengths, and key means for rotating said rotatable member to move said latch means to its lock-open position, said key means comprising a body having a plurality of posts projecting from an end surface thereof and positioned for insertion into the exposed ends of the bores at the forward surface of the casing member, said pins being sized to engage said tumbler means to slide said lock pins and tumbler pins to a position in which their confronting ends are located on said shear plane thereby permitting rotation of said movable member relative to said fixed member, and a plurality of dummy pins mounted in at least some of the axial bores of said casing member.

4,006,616

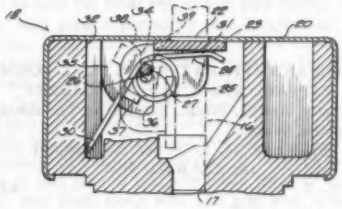
WEATHER SEALED LOCK MECHANISM

Hugo G. Rubner, Milwaukee, and Robert R. Spreng, Brookfield, both of Wis., assignors to Briggs and Stratton Corporation, Wauwatosa, Wis.

Filed Sept. 25, 1975, Ser. No. 616,580

Int. Cl.² E05B 17/18

U.S. Cl. 70—455 **11 Claims**



1. A rotatable lock cylinder having in a forward end thereof a cavity in which a shutter is receivable and to the bottom of which an axial key slot opens, said cylinder also having a covering wall secured thereto normal to the cylinder axis and extending across the mouth of the cavity to close the same, said wall having a keyhole therein aligning with the key slot, said cylinder being characterized by:

A. a shutter in said cavity comprising a flap to sealingly engage the rear surface of said wall all around the keyhole therein;

B. means pivotally mounting the shutter for fore and aft rocking motion of its flap toward and from sealing engagement with the rear surface of said wall, comprising

1. a hinge pin extending across the cavity at one side of the keyhole, and

2. means on the cylinder defining sockets which open unrestrictedly to the rear surface of said wall and laterally inwardly to opposite sides of the cavity, in which sockets the opposite end portions of the hinge pin are received;

C. a spring in the cavity

1. having an arm which reacts against a surface portion on the cylinder that faces laterally into the cavity and extends substantially parallel to the hinge pin at the side thereof remote from the keyhole, and

2. having at least one other arm that acts upon the shutter to firmly but yieldingly urge its flap forwardly into sealing engagement with the rear surface of said wall; and

D. cooperating abutment means on the cylinder and the shutter engageable prior to securement of said wall to the cylinder to prevent spring propulsion of the shutter about its pivot axis beyond a position at which its flap extends only a short distance out of the cavity and defines but a small obtuse angle to the cylinder axis, said abutment means comprising

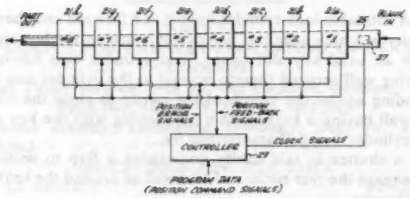
1. another surface on the cylinder, in said cavity, which faces toward the first mentioned surface portion on the cylinder and which is defined by a recess at one side of the cavity that is adjacent to one of said sockets, and
2. a lug on said shutter extending into said recess and engageable with said other surface on the cylinder upon rotation of the shutter to its said position, said lug being spaced to the side of the hinge pin that is remote from the flap and said recess being wide enough to allow movement of said lug away from said other surface on the cylinder when the flap pivots rearwardly toward the bottom of the cavity upon insertion of a key for the cylinder into said keyhole and key slot.

4,006,617

METHOD AND APPARATUS FOR ROLL FORMING TAPERED STRUCTURAL MEMBERS

Gene B. Foster, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Nov. 24, 1975, Ser. No. 634,431
Int. Cl.² B21D *5/08*
U.S. Cl. 72—7 **42 Claims**



1. A method of roll forming tapered structural members comprising the steps of:

passing a blank through a plurality of roll forming stations, each of said stations including assemblies of forming rolls, at least one of said forming rolls of each assembly being individually and differently position adjustable with respect to the position of the position adjustable forming rolls of the other of said plurality of roll forming stations; and,

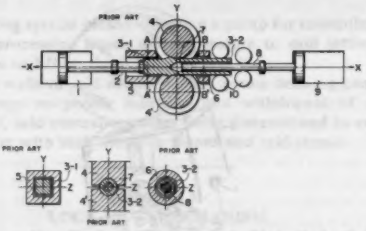
controlling the position of said position adjustable forming rolls of said plurality of roll forming stations as said blank passes through said plurality of roll forming stations in a manner such that the position of said position adjustable forming rolls of each roll forming station are selectively, independently varied in an individual and different manner between zero variation and continuous variation as a given point of said blank passes through said plurality of roll forming stations such that at least a portion of said blank is tapered.

4,006,618

METHOD OF PRODUCING SEAMLESS STEEL TUBE

Samon Yanagimoto; Minoru Kawaharada; Seishiro Yoshiwara; Susumu Mizunuma, and Motoaki Sugiyama, all of Kitakyushu, Japan, assignors to Samon Yanagimoto and Nippon Steel Corporation, Tokyo, Japan

Filed July 21, 1975, Ser. No. 597,812
Claims priority, application Japan, Dec. 28, 1974, 50-149151
Int. Cl.² B21B *19/04, 37/00*
U.S. Cl. 72—10 **12 Claims**



1. A method of producing seamless shell tube of uniform wall thickness, which comprises applying a force to a billet having an unapertured square or rectangular cross-section for pushing the billet forward along the longitudinal axis thereof;

applying a plurality of guide rolls to said billet spaced along the length of the path of the billet as it is moving forward under said pushing force for forcedly guiding the billet to keep the axis of said billet in alignment with a piercing plug at the center of the roll pass of a piercing mill; and

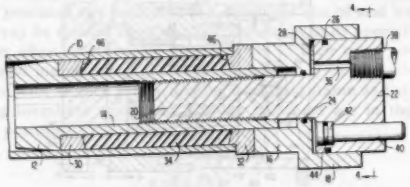
while said billet is moving forward under the effect of said pushing force and also is being forcedly guided, forcing said billet through the roll pass defined by a pair of rolling rolls mounted one above the other in the piercing mill for reducing the cross-section of said billet and rounding it and at the same time forcing the billet over the plug supported between said rolling rolls at the center of the cross-section of the roll pass for piercing the billet.

4,006,619

TUBE EXPANDER UTILIZING HYDRAULICALLY ACTUATED PISTONS

James Hilbert Anderson, 1615 Hillock Lane, York, Pa. 17403

Filed Aug. 7, 1975, Ser. No. 604,023
Int. Cl.² B21D *22/10*
U.S. Cl. 72—54 **9 Claims**



1. Apparatus for radially expanding an area of a tubular conduit or pipe comprising an expander unit positioned within said tubular conduit or pipe, said unit having a member with a stem portion arranged in co-axial relationship with said tubular conduit or pipe,

a compressible ring element mounted on said stem portion,

a cylinder member,

a piston member slidably positioned within said cylinder member,

said stem portion connected to one of said last mentioned members,

a band element positioned on said stem portion between said ring element and said member and a band element positioned on said stem portion between said ring element and one of said last mentioned members,

said band elements having a higher modulus of elasticity than said compressible ring element but less than that of said member and said one of said last mentioned members,

and means for delivering fluid under pressure to said cylinder member for moving said piston member with respect thereto for axially compressing said ring element between said band elements contemporaneous with the radial expansion of an area of said tubular conduit or pipe by said ring element.

4,006,620

DEVICE FOR SHAPING AND TRANSPORTING COIL FASTENER ELEMENTS

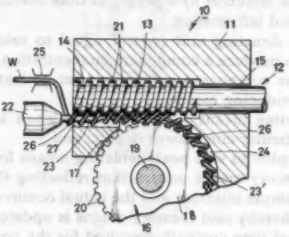
Shigenori Omori, and Fumio Terada, both of Uozu, Japan, assignors to Yoshida Kogyo Kabushiki Kaisha, Japan

Filed Aug. 25, 1975, Ser. No. 607,235

Claims priority, application Japan, Sept. 5, 1974, 49-102234

Int. Cl.² B21D *11/00*; B21F *3/04*

U.S. Cl. 72—66 **3 Claims**



1. A device for shaping and transporting a coil fastener element which comprises a frame, a screw mounted in a first cavity formed in said frame, said screw being rotatable about its longitudinal axis relative to the frame; carrier means having an endless toothed periphery and mounted in a second cavity formed in said frame and communicating with said first cavity, said carrier means being rotatable relative to the frame about an axis generally transverse to the longitudinal axis of said screw to move the peripheral teeth of the carrier means along a curved path passing in adjacent spaced-apart relation to the threads of said screw, said scew and carrier means being positioned to engage said fastener element coil and shape same; and a mandrel interposed between said carrier means and said screw, said mandrel being disposed to accommodate the winding thereabout of a filament to form a continuous coil fastener element, said mandrel extending lengthwise first along a portion of said screw to convey said fastener element with the coils thereof in engagement with the threads of the screw, and then extending lengthwise along at least a portion of said curved path to convey said fastener element with the coils thereof in engagement with the peripheral teeth of the carrier means and away from said screw in a direction transverse to the longitudinal axis thereof.

4,006,621

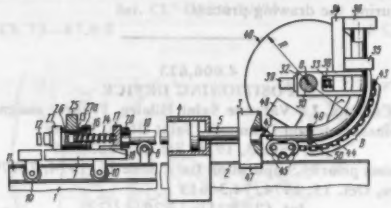
PIPE BENDING MACHINE

Evgeny Nikolaevich Moshnin, ulitsa Ak. Pavlova, 50, kv. 5; Alexei Fedorovich Nistratov, ulitsa Khlobystova, 16, korpus 1, kv. 48; Stanislav Ivanovich Yanov, Teply Stan, mikroraion 2, korpus 27, kv. 287; Raisa Ivanovna Goncharova, Sharikopodshipnikovskaya ulitsa, 2, kv. 153, and Zoya Mikhailovna Frolkina, Sharikopodshipnikovskaya ulitsa, 36/18, kv. 174, all of Moscow, U.S.S.R.

Filed May 27, 1975, Ser. No. 580,737

Int. Cl.² B21D *7/04*

U.S. Cl. 72—151 **9 Claims**



1. A pipe bending machine for bending pipe having a longitudinal centerline, comprising: a base; a longitudinal travelling mechanism mounted on said base and adapted to hold the pipe to be bent and move said pipe along the longitudinal axis thereof; a shaft mounted on said base transverse to the direction of motion of said longitudinal travelling mechanism; a grip with jaws, said grip being carried by said shaft and arranged eccentrically to the longitudinal axis of said shaft and adapted to hold the front end of said pipe during said movement of said pipe imparted by said longitudinal travelling mechanism; disks having a radius mounted on said shaft on both sides of said grip with jaws; tie members interconnecting said longitudinal travelling mechanism with said disks, the distance from the longitudinal axis of said shaft to the radius along which one of said tie members contacts one of said disks exceeding the distance from said longitudinal axis of said shaft to the middle of the pipe centerline in between the contact surfaces of said jaws of said grip when the jaws are brought together; said shaft along with said grip with jaws and said disks mounted thereon forming a bending mechanism.

4,006,622

CONTINUOUS PROCESS FOR THE PRODUCTION OF VERY LONG PRECISION TUBES AND INSTALLATION FOR CARRYING OUT THE PROCESS

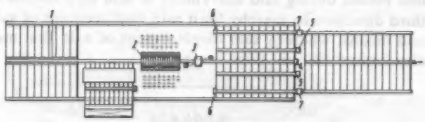
Johann Wassen, Brackwede; Heinz Kron, and Hans Pferdekamper, both of Dusseldorf, all of Germany, assignors to Mannesmannrohren-Werke AG, Dusseldorf, Germany

Filed July 25, 1975, Ser. No. 599,186

Claims priority, application Germany, Aug. 1, 1975, 2437441

Int. Cl.² B21B *15/00*

U.S. Cl. 72—206 **5 Claims**



1. A process for continuously producing long metal tubing to precise diameters from tubular metal blanks comprising:

a. telescoping a tubular blank onto a long mandrel;

b. cold forming the blank onto the mandrel, reducing the internal diameter of the blank to the diameter of the mandrel, and simultaneously elongating the blank for-

wardly to advance ahead of the mandrel and ahead of the cold forming means;

c. releasing the reduced blank from tight engagement with the mandrel, but leaving the telescoped blank on the mandrel for its support;

d. immediately thereafter and continuously pulling the blank through a drawing apparatus as it leaves the cold forming step for drawing in of the blank, all of the while the mandrel is in the blank and is still being held at its rear end; whereby the blank is drawn to final dimension continuously and immediately after it leaves the cold forming step, to be drawn in without any intermediate annealing, the removal of the mandrel from the tube occurring during the drawing process.

4,006,623

POSITIONING DEVICE

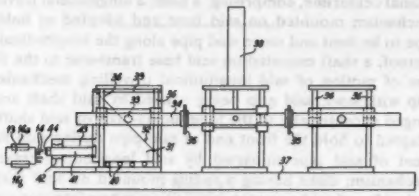
Paul Cailloux, La Varenne Saint Hilaire, France, assignor to Promecam Sisson-Lehmann, Saint Denis, France

Filed June 3, 1975, Ser. No. 583,504

Claims priority, application Italy, June 10, 1974, 23779/74; France, Oct. 15, 1974, 74.34613

Int. Cl.² B21D *11/20, 11/22*

U.S. Cl. 72—461 **6 Claims**



1. A device for positioning articles, comprising a support; first means mounted on said support for displacement in a first direction and operative for engaging an article so as to position the same relative to said suport; second means mounted on said support for displacement in a second direction substantially normal to said first direction and in a predetermined path; third means interposed between said first and second means and operative for transforming said displacement of said first means into said displacement of said second means in a predetermined ratio and including a wedge member having a sloping cam surface and connected to said second means to share said displacement thereof in said second direction, and a cam follower arrangement mounted on said first means to share said displacement thereof in said first direction and engaging said sloping cam surface of said wedge member; means for driving one of said first, second and third means so as to displace said first and second means in said ratio; and stop means mounted on said support for movement in a third direction substantially normal to said second direction and having a plurality of abutment portions sequentially projecting to various extents into said path of displacement of said second means during said movement of said stop means in said third direction to thereby limit said displacement of said second means, whereby said displacement of said first means is also limited via said third means.

4,006,624

PNEUMATIC CHROMATOGRAPH

Raymond Annino, Coldon, N.Y.; Robert C. Prescott, Foxboro; Edwin L. Karas, Sharon, both of Mass., and Richard W. Kalinoski, East Providence, R.I., assignors to The Foxboro Company, Foxboro, Mass.

Filed Feb. 14, 1975, Ser. No. 549,930

Int. Cl.² G01N *31/08*

U.S. Cl. 73—23.1 **13 Claims**

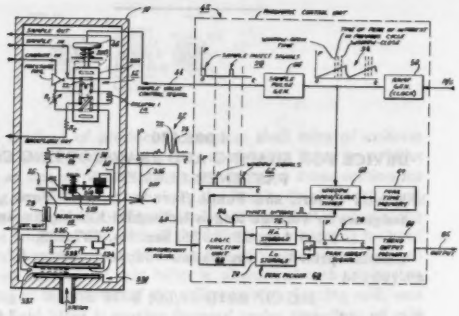
1. In chromatographic apparatus wherein a fluid sample is injected into a column to be carried therethrough so as to effect separation of the sample components to elute successively from the column, said apparatus further including signal-producing means responsive to the eluted sample components for producing a signal representing component concentration, and activating means responsive to a control signal for activating said signal-producing means at a time following injection of the sample into the column when one particular component of interest is expected to appear;

the improvement for producing said control signal comprising:

memory means adapted to store information corresponding to a time duration following sample injection after which said one component is predicted to appear;

timing means for measuring time after the injection of the sample;

means coupled to said memory means and to said timing means for developing a control signal which is subsequent



to sample injection by a period of time corresponding to said stored information;

means for directing said control signal to said activating means to produce a component concentration signal for a particular component appearing after activation of said signal-producing means;

peak-detecting means for determining when the peak of said particular component occurs; and

means coupled to said peak-detecting means for storing in said memory means information reflecting the time between sample injection and the actual occurrence of said peak, whereby said memory means is updated to reflect the actual time currently required for the component of interest to pass through the column means, the time of occurrence of said control signal for a subsequent measurement thereby being modified so as to track the time of appearance of the component of interest when that time changes due to changes in temperature and the like.

4,006,625

AMPLITUDE SORTING OF OSCILLATORY BURST SIGNALS BY SAMPLING

Thomas J. Davis, Richland, Wash., assignor to Battelle Memorial Institute, Columbus, Ohio

Filed July 30, 1975, Ser. No. 600,418

Int. Cl.² G01H *1/00*

U.S. Cl. 73—71.4 **15 Claims**

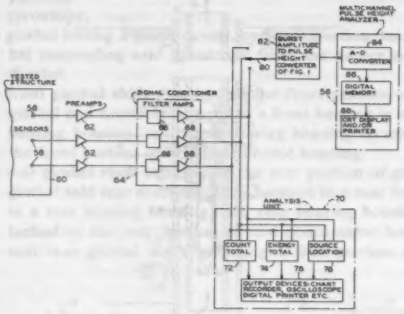
12. A method of acoustic emission testing of materials for different material anomalies, comprising:

sensing acoustic emission waves emitted by flaws and other anomalies in said materials, and converting said waves into oscillatory burst electrical signals;

detecting said oscillatory burst signals to produce an envelope signal corresponding to the envelope of the detected burst signal;

sampling an intermediate portion of said envelope signal to produce a sample pulse output whose pulse height corresponds to the peak amplitude of the detected burst signal; and

sorting the sample pulses of a plurality of successive envelope signals into different groups according to their pulse



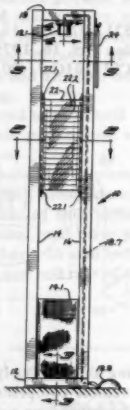
heights, certain of said groups corresponding to a different type of material anomaly.

4,006,626

METHOD AND APPARATUS FOR EVALUATING REBOUNDING CHARACTERISTICS OF OBJECTS

Josef Ruzicka, and Petr O. Ruzicka, both of 1705 Summit Ave., St. Paul, Minn. 55105

Filed Dec. 9, 1974, Ser. No. 530,991
Int. Cl.² G01N *3/52*
U.S. Cl. 73—13 **9 Claims**



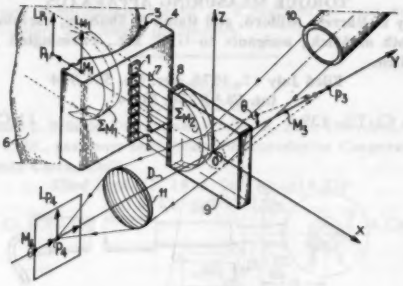
1. Apparatus for testing performance characteristics of balls and ball-impacting surfaces comprising a horizontal substrate, ball releasing means supported above and in vertical alignment with the substrate and capable of releasing a ball substantially without spin, the ball releasing means comprising a downwardly open holder having inner walls parallel to or at an acute angle with the vertical, the inner surface of the wall providing a peripheral vacuum seat against which the ball is seated, means providing a pressure differential between the top and bottom of the ball to hold the ball in seating engagement therein, and means for changing said pressure differential to permit the ball to drop from the holder; means providing a free-fall path for the ball from the release means to the substrate; and a scale for measuring rebound height, the scale comprising at least two sets of vertically spaced, height-indicating rule marks with the marks of one set spaced from and horizontally aligned with identical marks of the other set, the sets of rule marks being so positioned with respect to the free-fall path of the ball as to permit alignment of identical marks in each set with the ball as the latter reaches its maximum rebound height.

4,006,627

HIGH-SPEED ULTRASONIC ECHO-TOMOGRAPHIC DEVICE

Jean Bossaert, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Oct. 8, 1975, Ser. No. 620,913
Claims priority, application France, Oct. 11, 1974, 74.34304
Int. Cl.² G01N *29/04*
U.S. Cl. 73—67.8 S **6 Claims**



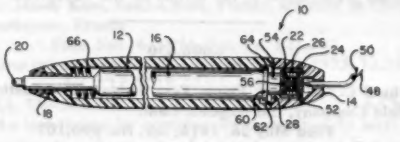
1. High speed ultrasonic echo-tomographic system comprising a generator of pulsed wave trains, a first straight line alignment of electroacoustic transducers, supplied in phase by said generator, said first alignment having a longitudinal dimension large in relation to the wavelength of the ultrasonic wave emitted, and coupled to the body being studied, so as to emit a plane shaped beam passing through a cross-section of said body, a second straight line alignment of tranducers electrically connected respectively to said transducers of the first alignment so as to retain the phase of the echo signals received by said first alignment, a crystalline medium, said second alignment being coupled to said crystalline medium to form in reply ultrasonic wave fronts in said medium, an optical system directing a beam of monochromatic light at an incidence substantially equal to the Bragg angle onto the fronts of waves emitted by the second alignment of transducers and optical means to collect one of the orders diffracted by said fronts from the beam emitted by said optical system.

4,006,628

MAGNETIC INDUCTION TYPE TRANSDUCER MEANS

Gerald A. St. Jacques, Germantown, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed Nov. 19, 1975, Ser. No. 633,327
Int. Cl.² G01L *5/00*
U.S. Cl. 73—141 A **8 Claims**



6. A transducer means including a stylus for generating electrical signals proportional to varying forces exerted on a surface during movement of said stylus in contact with said surface, said transducer means also comprising:

a housing adapted to be grasped by a user;

first and second core means being cylindrical in shape with

each having an annular recess therein and being mounted for movement relative to each other in said housing;

a resilient means positioned between and interconnecting said first and second core means;

a coil means mounted in said annular recesses of and coupled to said first and second core means;

said stylus contacting one of said first and second core means to transfer said varying forces thereto to change the coupling between said first and second core means; and

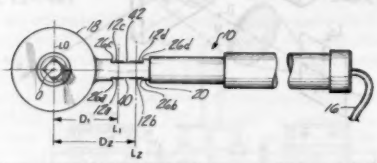
oscillator means coupled to said coil means whereby the frequency of said oscillator means changes in accordance with said varying forces to generate said electrical signals.

4,006,629

TORQUE MEASURING APPARATUS

Gary L. Barrett, Milford, and Ralph S. Shoberg, Farmington, both of Mich., assignors to GSE, Inc., Farmington Hills, Mich.

Filed July 17, 1975, Ser. No. 596,914
Int. Cl.² B25B 23/14
U.S. Cl. 73—139 **11 Claims**



6. A torque wrench comprising: an integral metallic body having a head adapted to engage and turn a workpiece about an axis of rotation, and a handle extending from the head and perpendicular to the axis of rotation for reacting to force applied normally to the handle and at a distance from the head; first and second transducer means operatively attached to the handle at first and second sensing points along the longitudinal axis of the handle for sensing elastic strain in the handle and producing a corresponding electrical signal, the first and second sensing points being spaced from one another so as to satisfy the relationship:

$$GF1 \cdot D1/Z1 = GF2 \cdot D2/Z2$$

where: D1 and D2 are the respective distances from the first and second sensing points to the intersection of the longitudinal axis of the handle and a line mutually perpendicular to both the axis of rotation and the longitudinal axis of the handle, Z1 and Z2 are the respective section moduli of the first and second sensing points, and GF1 and GF2 are the respective sensitivities of the transducer means; means for measuring the difference between the electrical signal values corresponding to the elastic strain at the first and second sensing points so as to provide an electrical output signal directly proportional to the torque as the rotational workpiece; and, display means for receiving the electrical output signal and translating it into a visual presentation of the torque on the workpiece.

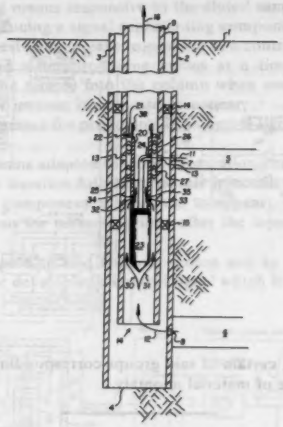
4,006,630

WELL TESTING APPARATUS

Richard L. Cathriner, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed May 26, 1976, Ser. No. 690,107
Int. Cl.² E21B 47/06
U.S. Cl. 73—155 **4 Claims**

1. Downhole well testing apparatus comprising mandrel means adapted to pass through said well to the situs of testing, said mandrel having at least one aperture communicating with the outside thereof, said mandrel carrying testing means, conduit means operatively connecting said at least one aperture to said testing means, packing means carried by said mandrel for isolating said at least one aperture in an annulus



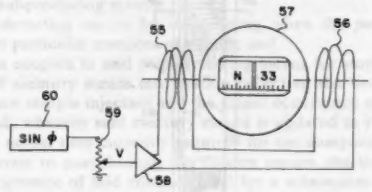
between said mandrel and a surface outside said mandrel, and by-pass means carried by said mandrel to allow fluid to pass by said mandrel after said packing means is set.

4,006,631

MAGNETIC HEADING REFERENCE

Howell D. Garner, Newport News, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 531,647, Dec. 11, 1974, Pat. No. 3,943,763. This application Oct. 16, 1975, Ser. No. 623,156
Int. Cl.² G01C 21/00
U.S. Cl. 73—178 R **4 Claims**



1. Means for correcting the northerly turning error of a magnetic compass on a vehicle comprising:

means on said vehicle for generating a signal proportional to V sin ϕ where V is the vertical component of the earth's magnetic field at the location of the vehicle and ϕ is the bank angle of the vehicle, and

coil means surrounding said compass and receiving said generated signal for generating a force proportional to V sin ϕ on the needle of said compass in a direction opposite to the force on said needle caused by the northerly turning error.

4,006,632

AIRCRAFT TURN COORDINATOR

Del Bianco Saverio, Milan, Italy, assignor to Aeritalia S.p.A., Milan, Italy

Filed Nov. 4, 1975, Ser. No. 628,737
Int. Cl.² G01C 21/00
U.S. Cl. 73—178 R **6 Claims**

1. An aircraft turn coordinator used in an aircraft to sense

both yaw and roll rate along the longitudinal flight axis, the coordinator comprising:

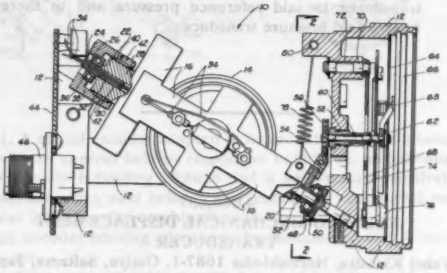
an elongated coordinator having a front, center, and rear portion;

a gyroscope;

a gimbal having a front, center, and rear portion, said gimbal suspending said gyroscope from the center portion thereof;

a front gimbal shaft attached to the front portion of said gimbal and rotatably secured to a front bearing in a front bearing housing, said front bearing housing attached to the front portion of said coordinator housing;

a rear gimbal shaft attached to the rear portion of gimbal, gimbal said rear shaft rotatably secured to a rear bearing in a rear bearing housing, said rear bearing housing attached to the rear portion of said coordinator housing, said rear gimbal shaft including a first portion and a



second portion, said first portion having a smaller diameter than said second portion, said first portion rotatably secured to said rear bearing, said second portion rotatably supported by a fluid damper means, said damper means contained between an annular surface of said second portion and an inner annular surface of said rear bearing housing;

a drive gear secured to said front gimbal shaft for driving a pinion gear, said pinion gear attached to a pinion gear shaft; and

a rotatable turn indicator arm attached to said pinion gear shaft and mounted alongside an indicator dial face and the front portion of said indicator housing, said gyroscope, said gimbal, said drive gear, and said pinion gear co-acting together with said indicator arm to indicate the amount of yaw and roll rate of the aircraft on said indicator dial face.

4,006,633

METHOD AND APPARATUS FOR DETERMINING HEAT REMOVAL FROM A CONTINUOUS CASTER

Johnson Shipman, and Herbert L. Gilles, both of Bethlehem, Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

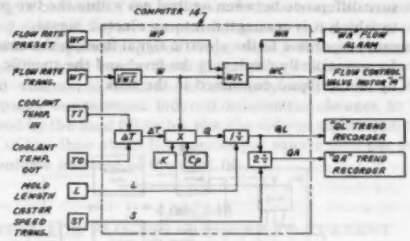
Filed Apr. 22, 1976, Ser. No. 679,117
Int. Cl.² G01K *17/06*; B22D *11/124*
U.S. Cl. 73—190 H **24 Claims**

1. In a continuous metal caster having plural solidification means for casting a single strand, each said means having a coolant flowing therethrough, a method of determining at least one thermal parameter associated with each said solidification means, which method comprises:

a. measuring coolant flow rate and coolant temperature in and out of at least one solidification means,

b. determining a length parameter associated with at least one solidification means used to solidify metal into a moving cast strand, and

c. determining heat removal rate per unit length of at least



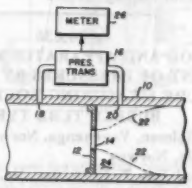
one solidification means as a function of said means coolant and length parameters.

4,006,634

FLOW METER

Richard J. Billette, Dublin, and Arthur R. Zias, Los Altos, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Sept. 17, 1975, Ser. No. 614,329
Int. Cl.² G01F *1/22*
U.S. Cl. 73—207 **4 Claims**



1. A flow meter comprising:

a. transducer means for sensing a pressure differential between a first port thereof and a second port thereof,

b. a conduit with said first port of said transducer means connected at a first location in said conduit and in fluid communication with fluid flowing therethrough, the fluid at a second location in said conduit being connected to and in fluid communication with said second port, and

c. an obstruction mounted in said conduit between said first location and said second location, said obstruction comprising a plurality of independently flexible spring fingers extending initially in a plane transverse to the flow of fluid in said conduit each of said fingers being compliant to said fluid flow and deflected in response to one parameter of said fluid flow whereby said obstruction to said fluid flow varies in response to said one parameter.

4,006,635

LIQUID LEVEL MEASURING PROCESS AND INDICATOR

Danny James Khoi, Saint-Cloud, France, assignor to Cermat, Courbevoie, France

Filed Nov. 6, 1974, Ser. No. 521,302
Claims priority, application France, Nov. 8, 1973, 73.39672
Int. Cl.² G01F *23/18*; G01N *9/28*
U.S. Cl. 73—302 **6 Claims**

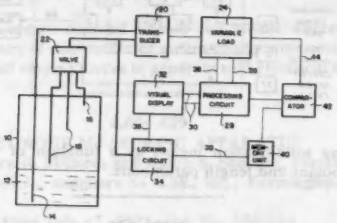
1. An installation for continuously measuring the level and the average specific gravity of a liquid contained in a large-capacity tank, especially tanks of vessels for transporting liquefied natural gas, comprising:

a plurality of hydrostatic probes for spraying neutral gas into the tank, the outlets of said probes being at different levels within the tank,

a transducer having two inputs which are connectable to all

of said probes but are connected at any one time to only two of said probes, said transducer converting the pressure difference between neutral gas within the two probes to which it is connected into an electric signal,

means responsive to the electric signal from said transducer for numerically displaying the level and the specific gravity of the liquid contained in the tank,



a variable load between said transducer and said display means for producing a signal proportional to said electric signal from said transducer, and

a circuit responsive to the liquid level reaching the outlet of one of said probes for adjusting said variable load so that the signal provided by said variable load causes the known level of the outlet of said one probe to be displayed by said display means.

4,006,636

METHOD AND APPARATUS FOR EXACT MEASUREMENT OF PRESSURES BY MEANS OF LEVEL OR PRESSURE MEASURING EQUIPMENT OF THE BUBBLE TUBE TYPE

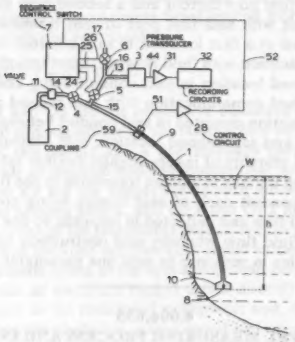
Hans Kristian Holmen, Voyenenga, Norway, assignor to Lehmkuhl A/S, Oslo, Norway

Filed July 7, 1975, Ser. No. 593,533

Claims priority, application Norway, July 5, 1974, 742463

Int. Cl.² G01F *23/16*

U.S. Cl. 73—302 **22 Claims**



1. A method for measuring pressures by the use of level or pressure measuring equipment of the type including a bubble tube having a first end thereof positioned in a body of liquid, a source of pressure connectable to a second end of said bubble tube via a first closeable line, a pressure transducer and recorder connectable to said bubble tube via a second closeable line, said pressure transducer being connectable to a reference pressure source via a third closeable line, said pressure transducer being activated to measure pressure in lines exposed thereto and deactivated to interrupt measurement; said method comprising:

opening said third line and activating said transducer and recorder to thereby measure and record said reference pressure;

closing said third line and deactivating said transducer, and then opening said first line to expose said bubble tube to said source of pressure to expell any liquid from said bubble tube;

opening said second line to expose said second line to said source of pressure;

closing said first line and stabilizing the pressure in said bubble tube and said second line for a time sufficient to achieve a static pressure condition therein;

activating said pressure transducer and recorder for a measuring interval of short duration, thereby measuring the static pressure in said bubble tube and said second line, and obtaining a desired measurement as the difference between said reference pressure and said static pressure; and

immediately after said measuring interval, deactivating said pressure transducer and recorder, closing said second line, and opening said third line to expose said pressure transducer to said reference pressure and to thereby relieve said pressure transducer.

4,006,637

ELECTRO-MECHANICAL DISPLACEMENT TRANSDUCER

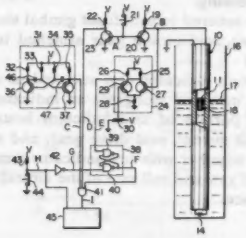
Yohei Kinosita, Horisaki-cho 1087-1, Omiya, Saitama, Japan (330)

Filed May 7, 1976, Ser. No. 684,397

Claims priority, application Japan, May 16, 1975, 50-057210; Aug. 29, 1975, 50-104041

Int. Cl.² G01F *23/26*

U.S. Cl. 73—313 **8 Claims**

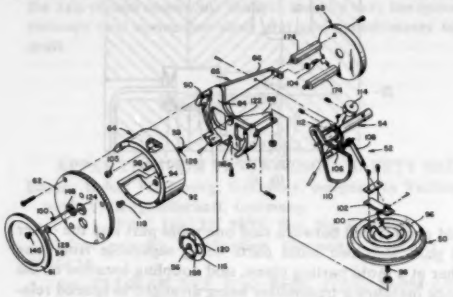


1. An electro-mechanical displacement transducer comprising a probe on which shunt capacitance and series inductance are uniformly distributed lengthwise to form a distributive constant circuit, said probe including elongate substantially coaxial hollow conductor members with annular insulating means interposed therebetween, at least one of said conductor members being a tightly wound coil extending lengthwise of said probe, means having an impedance equivalent to the characteristic impedance of the distributive constant circuit and connecting said inner and outer conductor members at the receiving end of the probe, said conductor members having sending ends, remote from said receiving end, connectible to an electrical wave generating means, said probe including a hollow space extending longitudinally thereof for receiving relatively movable means introducing an impedance variation shiftable therein lengthwise of said probe, whereby the position of such impedance variation means movable inside said probe is detectable by the span of time during which an electromagnetic wave emitted from the sending end of the distributive constant circuit travels to and back from the location of said impedance variation means in said probe.

4,006,638
ALTIMETER-ENCODER

Rudolf G. Woelfl, Woodland Hills, Calif., assignor to G & H Technology, Inc., Santa Monica, Calif.

Filed Oct. 24, 1974, Ser. No. 517,482
Int. Cl.² G01L 7/14
U.S. Cl. 73—387 22 Claims



1. A digital encoder adapted to be mounted in an altimeter having an aneroid bellows responsive to altitude, an indicator for visually indicating altitude and a gear train operatively interconnecting said bellows and indicator, said digital encoder including the combination of:

an encoder housing adapted to be mounted on said altimeter,

a drive gear rotatably mounted in said housing, said gear being positioned to mesh with the gear train in said altimeter and to be driven thereby when said housing is mounted in said altimeter,

a photo-optical data disc rotatably mounted on said housing, said photo-optical disc being operatively interconnected with said drive gear and driven thereby,

a series of opaque and transparent data regions on said data disc, said regions being digitally coded to correspond to altitude,

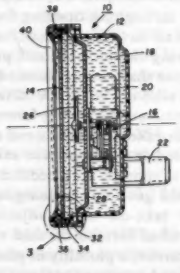
a photo-optical sensor mounted on said housing and positioned adjacent said disc for scanning said regions as said disc is driven by said gear, said sensor being effective to produce digital signals representing altitude, and

means for movably mounting said encoder housing in said altimeter whereby the housing may be moved relative to the gear train without disengaging said gear therefrom to thereby change the position of said photo-optical sensor relative to the data disc.

4,006,639
TEMPERATURE COMPENSATION FOR LIQUID FILLED PRESSURE GAUGE

Richard H. Wetterhorn, Fairfield, Conn., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Sept. 29, 1975, Ser. No. 617,356
Int. Cl.² G01L 7/04, 19/04
U.S. Cl. 73—393 4 Claims

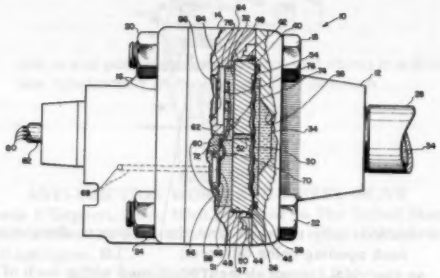


1. In a casing for a fluid filled pressure gauge including a case and a crystal comprising walls supported forming a fluid-tight enclosure containing a pressure sensitive element extending to outward of the enclosure for receiving an internally applied pressure input, compensating means comprising said crystal to compensate against temperature induced volumetric changes incurred by the fluid fill, said crystal having a controlled volumetric stiffness substantially correlated to the anticipated temperature induced volumetric changes to be incurred by the fluid fill with a specific volume stiffness on the order of less than about 0.1 pounds per square inch per percent volume increase of the fluid fill.

4,006,640
SEAL FOR PROCESS PRESSURE TO CURRENT TRANSMITTER

Arthur E. Gealt, Philadelphia, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 6, 1976, Ser. No. 655,855
Int. Cl.² G01L 19/04
U.S. Cl. 73—393 10 Claims



9. A pressure to current transmitter comprising

a hollow process fluid inlet portion having an inlet end and an open end,

a hollow body portion having an open end facing said open end of said inlet portion,

a diaphragm,

a backup plate supporting said diaphragm, across said open end of said inlet portion,

a free-standing ring integral with and extending from said body portion as an extension of said open end and positioned in a surrounding spaced relationship with said backup plate,

a welded joint extending between a surface at a free end of said ring and an adjacent surface of said backup plate, said free end of said ring being deflectable radially in a cantilever fashion upon said body portion by a force applied through said welded joint from said backup plate upon a change in ambient temperature,

fluid passage means in said backup plate to provide a fluid passage from said open end of said body portion to a volume enclosed by said diaphragm and said backup plate and

sensor means located in said body portion and arranged to detect changes in pressure of a fluid in said body portion communicating with said diaphragm in said volume by way of said fluid passage means.

4,006,641
METHOD AND APPARATUS FOR SENSING AND MEASURING FLUID PRESSURE

Ralph W. Alten, East Detroit, Mich., assignor to Dynamic Industries, Inc., Warren, Mich.

Filed Jan. 5, 1976, Ser. No. 647,259
Int. Cl.² G01L 9/02
U.S. Cl. 73—398 AR 12 Claims

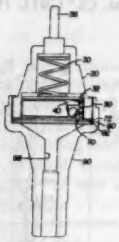
1. In an apparatus adapted to provide a normally open electrical circuit for sensing the pressure of a fluid, including:

a housing defining an internal chamber and including a bore extending from the chamber for communicating with said fluid;

a deflectable diaphragm positioned in said chamber and overlying said bore, the fluid being permitted to flow through the bore against said diaphragm but being prevented from flowing into said chamber, the diaphragm being deflected in response to fluid pressure;

a pair of spaced, electrically conductive members within said chamber providing a normally open electrical circuit, said conductive members being in general alignment with said diaphragm;

a deformable, resilient pad interposed between said spaced electrically conductive members, the pad having a plurality of openings extending therethrough substantially perpendicular to said electrically conductive members, the longitudinal dimension of each of said openings being



substantially the same and the transverse dimension of each opening being different;

an electrical contact element positioned within each of said openings providing parallel branch elements in an electrical circuit, the longitudinal dimension of each contact element being less than the corresponding longitudinal dimension of each of said openings to provide a normally opened circuit, and a resistor element associated with each contact element whereby the flow of electrical current through said normally opened circuit a proportional to the pressure of said fluid, said pad being deformed in response to the fluid pressure and to the deflection of the diaphragm such that the contact element which is in the largest of said openings closes the electrical circuit first, with the remainder of said contact elements progressively closing the circuit at increased fluid pressure to accommodate increased electrical current flow.

4,006,642

APPARATUS FOR A MULTI-PART INJECTION MOLD FOR MEASURING THE DEGREE OF FILLING OF THE HOLLOW MOLD COMPARTMENT OR THE CLOSURE PRESSURE OF THE MOLD

Eduard Hartmann, Urdorf, Switzerland, assignor to Bucher-Guyer AG, Niederweningen, Switzerland

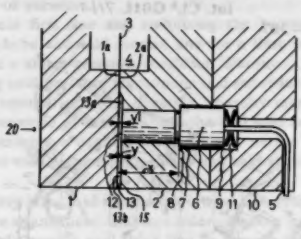
Filed Feb. 18, 1975, Ser. No. 550,472

Claims priority, application Switzerland, Feb. 26, 1974, 2731/74

Int. Cl.² G01P *13/00*; B29G *3/00*

U.S. Cl. 73—432 R **8 Claims**

1. A measuring apparatus for a multi-part injection mold for measuring the degree of filling of a hollow mold compartment with injected molding material or the closing pressure of the mold comprising, in combination, a mold defined by at least two mold parts forming therebetween a hollow mold compartment, a distance measuring transmitter arranged in spaced relationship from the hollow mold compartment and having an end face, means for coupling the distance measuring transmitter at a coupling location with one mold part, a surface provided for the other mold part and situated opposite said end face of the distance measuring transmitter, means providing an intermediate space between said end face of the distance measuring transmitter and the oppositely situated surface of said other mold part when the mold is closed, said distance measuring transmitter being responsive to changes of



a mold gap formed between said one mold part and the other mold part, said two mold parts being separable from one another at a mold parting plane, said coupling location of the distance measuring transmitter being arranged in spaced relationship from the mold parting plane.

4,006,643

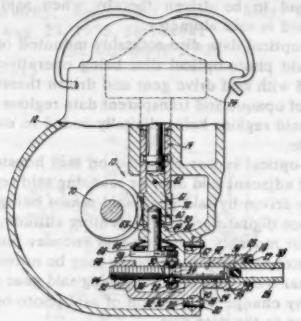
SPEEDOMETER DRIVE ARRANGEMENT

Lubomyr O. Hewko, Port Clinton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 15, 1975, Ser. No. 604,916

Int. Cl.² F16H *13/06*, *13/10*, *15/10*, *37/02*

U.S. Cl. 74—12 **3 Claims**



1. A continuously variable speedometer drive arrangement comprising a governor housing, governor drive means mounted in said housing, a connector shaft secured to said governor drive means and extending through a first fixed support abutment formed in said governor housing, a flange formed on the end of said connector shaft exterior said first abutment, preloaded spring means mounted between said flange and said first abutment, a speedometer take-off shaft rotatably mounted through an opening formed in said governor housing so as to have inner and outer ends extending therefrom and having the axis thereof perpendicular to the axis of said connector shaft, means formed on the outer end of said speedometer take-off shaft for driving a speedometer drive cable, a circular axial opening formed on the inner end of said speedometer take-off shaft, a rod member having one end thereof mounted in said circular axial opening and the other end thereof supported on a second fixed support abutment formed in said governor housing, a carrier formed on said speedometer take-off shaft adjacent said inner end thereof, a sun member formed on said rod member radially aligned with said carrier, a plurality of planets mounted in said carrier and preloaded intermediate said sun member and an outer ring, said outer ring being frictionally contacted by said

flange under the force of said preloaded spring means a predetermined distance from the axis of said connector shaft for driving said speedometer take-off shaft at a predetermined speed ratio with respect to said connector shaft, and adjustment means operatively connected to said rod member for axially moving said rod member and, hence, said inner race, said planets and said outer race for varying said distance from the axis of said connector shaft to thereby vary the speed ratio between said connector shaft and said speedometer take-off shaft.

4,006,644

APPARATUS FOR TENSIONING A SAFETY BELT

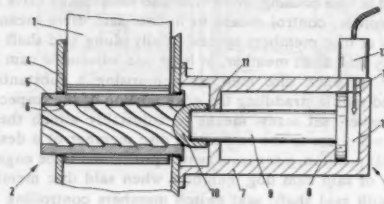
Edmar Beier, Wolfsburg, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Germany

Filed Jan. 21, 1976, Ser. No. 650,879

Claims priority, application Germany, Feb. 11, 1975, 2505625

Int. Cl.² F16H *7/12, 7/10;* **B60K** *27/00;* **B60M** *1/04*

U.S. Cl. 74—242.1 FP **5 Claims**



1. Apparatus for tensioning a safety belt in response to applied gas pressure, comprising:

a hollow winding roller attached to said safety belt and having helical arial grooves on its inner surface;

a cylinder, coaxially adjacent to said roller;

a piston, arranged in said cylinder and displaceable in response to said gas pressure and having a piston rod with a soft metal sheathing to project into said roller, and burrow into said grooves, and to cause rotation of said roller in a safety belt tensioning direction.

4,006,645

X, Y, θ ALIGNMENT MECHANISM

William H. Newell, Mount Vernon, N.Y., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Sept. 26, 1974, Ser. No. 509,586

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 3, 1976

Int. Cl.² G05G *11/00*

U.S. Cl. 74—479 **10 Claims**

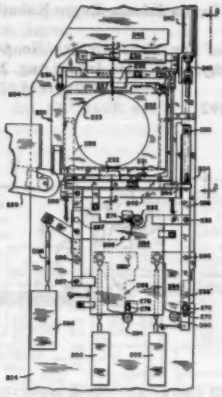
1. Positioning apparatus for positioning an object with respect to a fixed base comprising:

four links (240, 254, 256, 258; 300, 332, 330, 334) pivotally interconnected at points (253, 255, 257, 259; 338, 340, 337, 336) located at the corners of a parallelogram, a first link (240, 300) of said parallelogram supporting an object to be moved;

means to rotate a second link (254, 332) that is opposite said first link in said parallelogram and that is coupled to the base (204, 202);

means to translate said second link (254, 332) of said parallelogram; and

means to rotate a third link (258, 334) in said parallelogram, said links being interconnected with said second link (254, 332) so that rotation of said second link in said parallelogram rotates said object, so that translation of said second link in said parallelogram translates said object in a first direction and so that rotation of said third



link in said parallelogram translates said object in a direction substantially normal to said first direction.

4,006,646

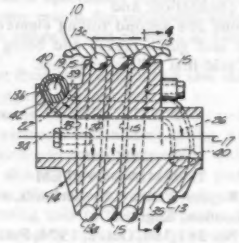
ANTI-FRICTION WORM AND WHEEL DRIVE

Erwin F'Geppert, Novi, Mich., assignor to The United States Government as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 9, 1975, Ser. No. 611,775

Int. Cl.² F16H *1/16, 1/20, 55/06*

U.S. Cl. 74—425 **5 Claims**



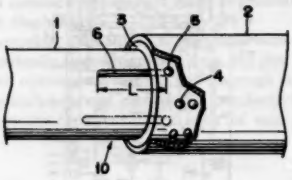
1. An anti-friction drive comprising a worm and wheel arranged with their rotational axes at right angles to each other; said worm having a helical groove in its peripheral surface, said wheel having spaced grooves adapted to successively mate with the helical groove as the wheel moves past the worm; an internal ball passage extending through the worm; a first ball return duct at one end of the worm for delivering balls from the worm helical groove to the internal ball passage; a second ball return duct at the other end of the worm for delivering balls from the internal passage to the worm helical groove; and anti-friction balls filling a passage system defined by the worm groove, ball return ducts, and internal passage; the helical grooves in the worm and wheel cooperatively defining a circular cross section race that produces rolling movements of the balls through the aforementioned passage system when a rotational force is applied to the worm; the depth of the helical groove in the worm being slightly greater than the ball radius, whereby the worm groove defines two spaced lip areas that captively prevent the balls from escaping from the worm groove while they are out of contact with the wheel.

4,006,647

IMPACT ENERGY ABSORBING APPARATUS

Toshio Oonuma, and Yutaka Tanaka, both of Aichi, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Aug. 12, 1975, Ser. No. 603,809
Claims priority, application Japan, Aug. 29, 1974, 49-99160
Int. Cl.² B62D 1/18
U.S. Cl. 74—492 9 Claims



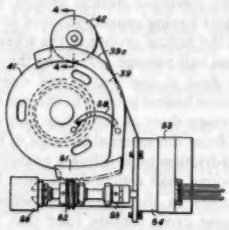
1. An impact energy absorbing apparatus comprising:
two cylindrical post members connected for telescopic movement relative to each other under axial impact applied thereto;
first rolling elements press fitted between said cylindrical post members at the telescoped connection and arranged in at least one annular row;
at least one idle second rolling element snugly positioned between said cylindrical post members at the telescoped connection;
a cage member between said cylindrical post members at the telescoped connection for retaining said first rolling elements and said at least one second rolling element therein;
at least one axially extending guide means of predetermined axial length defined in at least one of said cylindrical post members, said guide means extending axially from the telescoped connection; and
said at least one idle second rolling element being snugly received in said guide means and being axially spaced from all of said first rolling elements.

4,006,648

CAMMING SYSTEM

Cornelius J. de Keyzer, Venray, Netherlands, assignor to Rank Xerox Ltd., London, England

Division of Ser. No. 511,350, Oct. 2, 1974, Pat. No. 3,963,343. This application Mar. 12, 1975, Ser. No. 557,700
Int. Cl.² F16H 53/04
U.S. Cl. 74—568 R 5 Claims



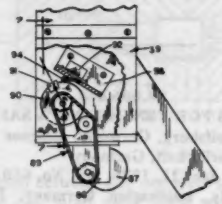
1. A camming system comprising a cam, a cam follower, means to drive the cam follower along a planar path to and from a starting position while in contact with the cam, and means to rotate the cam about a fixed axis outside the cam normal to the plane of said path.

4,006,649

SINGLE SHAFT PROGRAMMING CONTROL FOR MACHINE TOOLS

James W. Elmer, Anoka, Minn., assignor to Inventors Engineering, Inc., Minneapolis, Minn.

Division of Ser. No. 424,950, Dec. 17, 1973, abandoned. This application May 22, 1975, Ser. No. 579,882
Int. Cl.² F16H 53/04
U.S. Cl. 74—568 R 3 Claims



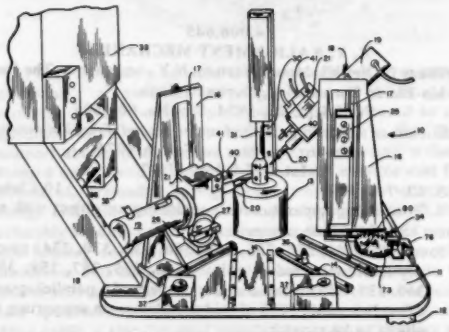
1. A programmer for controlling individual motions in a multiple operation machine tool for cyclic operation on a particular part comprising a housing, a shaft member rotatably mounted in said housing, drive means to rotationally drive said shaft member, control means to initiate said drive means, a plurality of disc members spaced axially along said shaft and driven by said shaft member, at least one adjustable cam dog member on each disc member comprising a substantially U-shaped saddle straddling the edge portion of the respective disc member, set screw means to adjustably attach the U-shaped members to the respective disc member at a desired rotational position, a separate switch positioned to be engaged by each of said cam dog members when said disc members rotate with said shaft, said switch members controlling machine tool functions.

4,006,650

INDEXING CONTROL FOR ROTATABLE PART ON A MACHINE TOOL

James W. Elmer, Anoka, Minn., assignor to Inventors Engineering, Inc., Minneapolis, Minn.

Division of Ser. No. 424,950, Dec. 17, 1973, abandoned. This application May 22, 1975, Ser. No. 580,045
Int. Cl.² B23B 29/32
U.S. Cl. 74—813 C 5 Claims



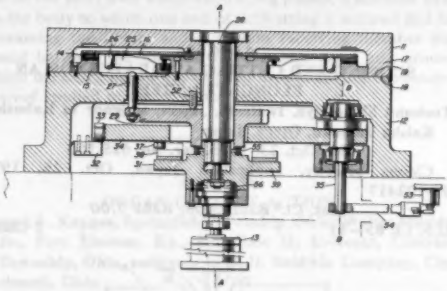
1. An indexing control for controlling operations on an indexed part movable about an axis including a base, means to rotatably mount said part on said base for rotary indexing motion about a preselected axis, an indexing control, synchronizing drive means driving said indexing control and said means rotatably mounting said part, means to initiate said drive means at preselected times, control means controlled by said indexing control separate from said means to initiate said

drive means, said indexing control comprising a rotatable member having cam support means positioned at a plurality of locations about the axis thereof for removably mounting cam means, cam means mounted on at least one of said cam support means on said rotatable member, said control means including an actuator positioned with respect to said base at a location so cam means positioned on said rotatable member engages the actuator at a desired rotational position as the rotatable member is rotating to provide a signal indicating a rotational position of said means rotatably mounting said part which is correlated precisely with the rotational position of said part through said synchronizing drive means.

4,006,651
WORK TABLE INDEX MECHANISM

Frank R. Anderson, and James W. Nadon, both of Biggleswade, England, assignors to Cincinnati Milacron-Heald Corporation, Worcester, Mass.

Filed June 13, 1975, Ser. No. 586,739
Int. Cl.² B23B *29/32*
U.S. Cl. 74—826 **14 Claims**

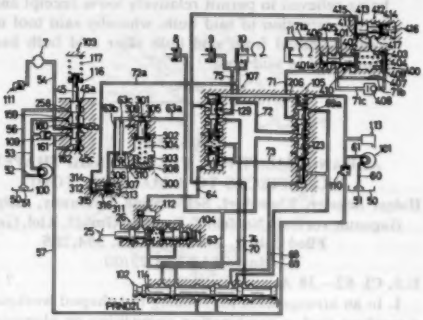


5. Machine tool, comprising
a. a first member,
b. a second member,
c. means moving the members relative to one another,
d. a first curvic coupling element mounted on the first member,
e. a second curvic coupling element mounted on the second member in concentric relationship on a main axis with the first curvic coupling element,
f. apparatus mounting the first curvic coupling element on the first member allowing relative movement under force in at least one mode, but not allowing such movement in the other modes, the apparatus consisting of a circular diaphragm whose center portion is fixed to the first member and whose periphery is fixed to the first curvic coupling element, relative movement along the main axis taking place between the first and second members to completely separate the teeth of the first and second curvic coupling element, the said apparatus allowing the said relative movement under force when the teeth engage, so that the said apparatus allows the first curvic coupling to move relative to the first member during engagement of its teeth with the teeth of the second curvic coupling in:
a translation mode along the said main axis,
a rotational mode about an axis perpendicular to said main axis, and
a rotational mode about an axis perpendicular to both of the aforementioned axes, and so that the said apparatus does not allow the first curvic coupling to move relative to the first member during engagment of its teeth with the teeth of the second curvic coupling in:
a translation mode along a line perpendicular to the said main axis,
a translation mode along a line perpendicular to both of the aforementioned line and axis, and
a rotational mode about the said axis.

4,006,652
FLUID PRESSURE CONTROL SYSTEM FOR MOTOR VEHICLE TRANSMISSIONS

Noboru Murakami, Nagoya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Japan

Filed Sept. 20, 1974, Ser. No. 507,800
Claims priority, application Japan, Sept. 25, 1973, 48-107833; Sept. 29, 1973, 48-109941
Int. Cl.² B60K *41/18*
U.S. Cl. 74—869 **8 Claims**

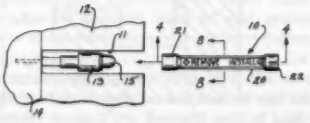


1. A fluid pressure control system for a motor vehicle transmission, comprising:
a hydraulic fluid pressure source;
fluid pressure regulator means for regulating the pressure of said hydraulic fluid from said fluid pressure source to a particular line pressure value;
a plurality of frictional engaging means actuated by said line pressure from said fluid pressure regulator means for attaining a particular gear ratio within the gear trains of said transmission;
shift valve means operativley connected to said fluid pressure regulator means for selectively supplying said line pressure to either of said plurality of frictional engaging means;
a first conduit fluidically connecting said shift valve to said frictional engaging means; and
modulator means, disposed within said conduit and including a first piston, a first biasing spring, and a drain port through which said hydraulic pressure within said conduit is drained due to movement of said piston against the biasing force of said spring, for initially, constantly, gradually increasing said hydraulic pressure supplied to said frictional engaging means and subsequently regulating said hydraulic pressure supplied to said frictional engaging means to a substantially constant value for engaging said frictional engaging means.

4,006,653
LAMP INSERTING AND EXTRACTING TOOL

Donald W. Kuntz, West Allis, Wis., assignor to Allen-Bradley Company, Milwaukee, Wis.

Filed Sept. 22, 1975, Ser. No. 615,870
Int. Cl.² B25B *13/52*
U.S. Cl. 81—64 **6 Claims**



1. A tool for inserting in and extracting from a relatively inaccessible area a miniature lamp bulb, or the like, arranged

for insertion and extraction in a direction paralleling the longitudinal axis of the lamp bulb and comprising:

a support;

a resilient, removal cup member disposed at one end of said support and adapted for receiving and frictionally engaging said bulb, whereby said bulb may be gripped for removal from said area, said removal cup member including means for releasing entrapped air during receipt of said lamp bulb;

a resilient installation cup member disposed at the opposite end of said support and with its defining wall surface being relieved to permit relatively loose receipt and temporary retention of said bulb, whereby said tool may be freely released from said bulb after said bulb has been positioned in said area.

4,006,654

ARRANGEMENT FOR FEEDING ROD SHAPED WORKPIECES TO A MACHINE TOOL

Holger Scheler, Klausdorf, Schwentine, Germany, assignor to Hagenuk vormals Neufeld & Kuhnke GmbH, Kiel, Germany

Filed July 9, 1975, Ser. No. 594,285

Int. Cl.² B23B *25/00*

U.S. Cl. 82—38 A **7 Claims**

1. In an arrangement for feeding rod-shaped workpieces to a machine tool, a combination comprising an elongated hollow guide member for accommodating a respective workpiece therein; support means extending longitudinally of said guide member and surrounding the same with spacing; and a plurality of elongated elastically yieldable hollow tubes filled with pressurized fluid, said tubes extending longitudinally of said guide member in said spacing and being operative for supporting said guide member on said support means and for damping oscillations to which said guide member is subjected during the operation of the arrangement so as to prevent transmission of the oscillations to said support means.

4,006,655

DEVICE FOR PROTECTING TOOLS AND WORKPIECES FROM DAMAGE ON A HYDRAULICALLY OR PNEUMATICALLY OPERATED STAMPING PRESS

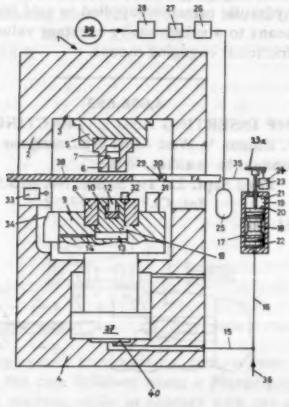
Martin Maurer, Romanshorn, Switzerland, assignor to Hydrel A.G., Romanshorn, Switzerland

Filed Mar. 17, 1976, Ser. No. 667,840

Claims priority, application Switzerland, Mar. 17, 1975, 3377/75

Int. Cl.² B26D *7/24, 5/20*

U.S. Cl. 83—63 **4 Claims**



1. A device for protecting tools and workpieces from damage on a hydraulically or pneumatically operated stamping press, comprising a rigid pressing table bearing the cutting tools and a movable pressing table, and a movable element which responds either when cutting tools contact the workpiece to be stamped or when a hard foreign body is disposed between the workpiece and one of the cutting tools; the movable pressing table being disposed in drive connection with a first switch and the movable element with a second switch such that the movable pressing table is arrested when the second switch is actuated before the first switch, characterized in that the movable control element (18) is disposed in a housing (17) disposed external to the two pressing tables (5,9); one side of the housing (17) being impinged by the pressure medium which operates the piston (38) and the other side being impinged by a second pressure medium having a variable constant pressure.

4,006,656

SCORING AND CUTTING APPARATUS FOR AN ELONGATED SHEET

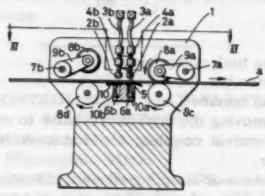
Tsutomu Shinomiya, Iwatsuki, Japan, assignor to Kabushiki Kaisha Tomoku, Otaru, Japan

Filed Oct. 23, 1975, Ser. No. 625,160

Claims priority, application Japan, Oct. 25, 1974, 49-122417

Int. Cl.² B26D *3/08*; B26F *3/00*

U.S. Cl. 83—11 **5 Claims**

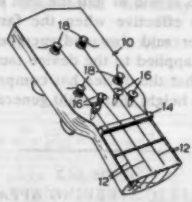


1. Apparatus for cutting and scoring an elongated sheet member, which is traveling longitudinally, along longitudinal lines at desired transverse spacing, said apparatus comprising a plurality of injection nozzles adapted for projecting a stream of high pressure liquid into the advancing sheet member to cut the same, means supporting said nozzles in two spaced transverse rows, a plurality of scoring rolls disposed in two spaced transverse rows extending parallel to the rows of projecting nozzles, support means for said scoring rolls to move the same upwards and downwards between respective inoperative and operative scoring positions, the supporting means for the nozzles including a transverse support member, said nozzles being slidably mounted on the support member for adjustment of the transverse spacing between the nozzles, said support means for each row of scoring rolls including a transverse support member, said rolls being slidably mounted on the support member for adjustment of the transverse spacing between the rolls, said transverse support member being a shaft, said support means further comprising pivot arms mounted on said shaft and carrying respective scoring rolls, said pivot arms being slidable on said shaft to adjust the transverse spacing between the rolls, at least one body disposed on the side of the sheet member opposite said nozzles, said body having at least one transverse groove facing the rows of said nozzles and being aligned therewith, and a cover on said body to facilitate travel of the sheet member thereon, said cover being provided with a slot aligned with said groove.

4,006,657
STRINGED MUSICAL INSTRUMENTS

Harry Dunnette, 953 Fraser Drive, Burlington, Ontario, Canada

Filed Jan. 2, 1976, Ser. No. 646,002
Int. Cl.² G10D 3/06, 3/14
U.S. Cl. 84—314 5 Claims

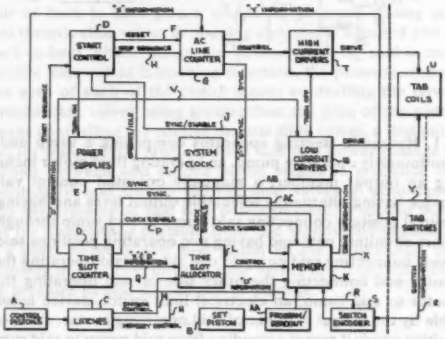


1. A stringed musical instrument comprising an instrument body, at least one string having its ends secured to the body, a nut on the body over which each string passes, a machine head on the body to which one end of each string is secured and for tensioning the string, and a tension receiving member disposed between the nut and the machine head and around which the string passes in a circular loop to reduce the tension thereof applied to the machine head.

4,006,658
ORGAN CAPTURE ACTION

Joseph L. Kappes, Springfield Township, Ohio; Walter Munch, Jr., Fort Thomas, Ky., and Dale M. Uetrecht, Colerain Township, Ohio, assignors to D. H. Baldwin Company, Cincinnati, Ohio

Continuation of Ser. No. 462,101, April 18, 1974, abandoned. This application Jan. 26, 1976, Ser. No. 652,515
Int. Cl.² G10B 3/10; G10H 1/00
U.S. Cl. 84—345 10 Claims

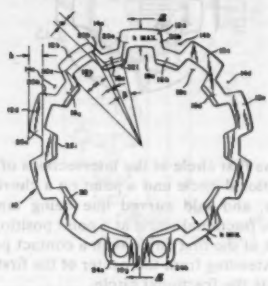


1. A combination stop system for an electronic organ, comprising an electronic memory, a set of tabs for setting stops, read in means for reading the settings of said tabs into said memory, read out means for setting said tabs in response to information stored in said memory, clock means operative for recirculating within said memory information stored in said memory at a predetermined rate, a rectifier system power supply for energizing said electronic memory and said clock means, a battery supply for said combination stop system, means energizing said memory and said clock means from said battery supply only in response to said power supply being off, means including a set of pistons for selectively operating said read in means and said read out means, and means responsive to operation of any one of said pistons for turning on said rectifier system power supply.

4,006,659
SPRING-METAL RETAINING RINGS

Hugo Wurzel, New York, and Melvin Millheiser, North Bellmore, both of N.Y., assignors to Waldes Kohinoor, Inc., Long Island City, N.Y.

Continuation-in-part of Ser. No. 550,113, Feb. 14, 1975, abandoned, and a continuation-in-part of Ser. No. 365,464, May 31, 1973, abandoned. This application Oct. 3, 1975, Ser. No. 619,689
Int. Cl.² F16C 33/30
U.S. Cl. 85—8.8 23 Claims



1. A multi-truss open-ended retaining ring adapted for assembly in a circumferential groove provided for its reception in the surface of a carrier member thereupon to form an artificial machine-part retaining shoulder projecting from said surface, the outer and inner edges of said ring body each comprising and being defined by the outer and inner edges respectively of a plurality of circumferentially spaced, non-radially related arcuate beams and said beams being connected by arms which extend divergently therebetween and provide the ring body with configuration in plan corresponding to that of a plurality of serially connected upright and inverted queen trusses, said beams having section height and said divergent connecting arms having lengths such that said arms dispose the inner-edges of said outer-edge defining arcuate beams and the outer edges of the inner-edge defining arcuate beams on arcs of circles which are spaced radially outwardly a small distance from one another, the construction and arrangement being such that circumferential stresses acting around the ring body will cause an elastic lengthening or contraction of the ring body to a significant, useful degree.

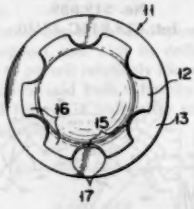
4,006,660
FASTENER ELEMENT

Keiichi Yamamoto, and Kozo Yamamoto, both of Tokyo, Japan, assignors to Yamamoto Byora Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 489,419, July 17, 1974, abandoned. This application Oct. 30, 1975, Ser. No. 627,338
Claims priority, application Japan, Sept. 8, 1973, 48-105453; Sept. 8, 1973, 48-105454; Sept. 8, 1973, 48-105455; Nov. 30, 1973, 48-138207
Int. Cl.² F16B 23/00
U.S. Cl. 85—45 14 Claims

1. A fastener element having a male head portion the outer periphery of which is provided with a plurality of substantially longitudinal grooves and a plurality of lobes each defined between two adjacent grooves, each of said grooves being arcuate in cross section and having a constant radius over its entire length and being inclined outwardly toward the forward end of the fastener element with respect to the central axis thereof at a predetermined angle α, and each of said lobes being inclined outwardly toward the forward end of said fastener element with respect to said central axis thereof at a predetermined angle β, each of said grooves being tangentially connected to the adjacent lobe through a smoothly curved wall

portion, the outer periphery of each of said lobes in cross section forming a segmented outline of a first circle, each of said grooves in cross section forming a fractional circle, the cross section of said curved wall portion forming a curved line, the center of said fractional circle being situated at a point positioned between a point nearer to the center of the first circle than the junction of two tangential lines which are



tangent to the first circle at the intersections of the first circle and the fractional circle and a point on a chord between said intersections, and said curved line being tangentially connected to the fractional circle at a point positioned not nearer to the center of the first circle than a contact point at which a radial line extending from the center of the first circle tangentially contacts the fractional circle.

4,006,661

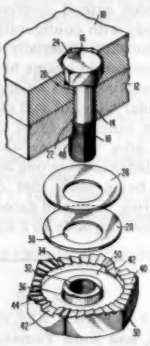
REUSABLE TORQUE LIMITING FASTENING DEVICE

Dewey McKinley Sims, Jr., Westland, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed Sept. 29, 1975, Ser. No. 617,978

Int. Cl.² F16B *31/02*

U.S. Cl. 85—62 **1 Claim**



1. A reusable, torque tactile feedback threaded fastening device that determines relatively accurately the tensile load in a bolt or similar fastening device comprising,

an elongated threaded member capable of being secured through one or more workpieces which are adapted to be fastened together,

a fastening member having a central threaded bore therethrough threadably receivable on said elongated member for securing said workpieces together as said fastening member is tightened on said elongated member,

a pair of concave members disposed on said fastening member and being capable of deflection from a concave to a substantially flat condition as said fastening member is tightened over said elongated threaded member, said fastening member further including a pair of concentric recessed portions therein, one of said portions receiving and capturing said concave members therein, the other of said portions being shaped to permit the central area of said concave members to deflect therewithin without abrading or frictionally engaging the elongated threaded member and

one or more radial notches disposed in said fastening member permitting said concave members to be viewed as the threaded member is tightened over said workpieces, said fastening member further including a series of sawtooth lands and grooves disposed about the perimeter of one surface thereof, said notches and said lands and grooves functioning to abraid or gall the first encountered workpiece surface effective when the fastening member is tightened over said threaded member to increase the torque being applied to the device tactilely indicating to an operator that the device has compressed the concave members to a height that would generate the correct bolt tensile load.

4,006,662

HYDRAULIC STEERING APPARATUS

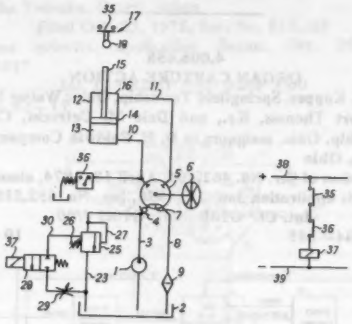
Carl Ivar Olsen, Sonderborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Division of Ser. No. 416,179, Nov. 15, 1973, Pat. No. 3,941,033. This application Nov. 28, 1975, Ser. No. 635,599

Claims priority, application Germany, Nov. 22, 1972, 2257230

Int. Cl.² F15B *11/08*, *13/043*

U.S. Cl. 91—400 **1 Claim**



1. Hydraulic steering apparatus comprising a sump and a continuously operative pump, an operating fluid motor including an output member, a manually operated control valve device having alternately selectable output lines and having a neutral position connecting said pump to said sump through a short-circuiting path and having two operating positions selectively connecting said pump to one side of said operating fluid motor and connecting the other side of said operating fluid motor to said sump, an electrical limit switch device actuatable by the output member of said operating motor, short-circuiting conduit means extending from said pump to said sump, first pressure responsive switch valve means in said short-circuiting conduit means for controlling flow in same and having a first pressure responsive portion open to pump pressure and a second pressure responsive portion, line pressure responsive electrical switch means connected to at least one of said output lines, passage means including an adjustable restriction means connected between said second pressure responsive portion of said switch valve means and said pump, electrically operated pilot valve means in said passage means controlling same when electrically operated for opening said first switch valve means, electrical circuit means connecting, said electrical limit switch device and said pressure responsive electrical switch in series with one another and with said electrically operated pilot valve means so that said pilot valve means is operable only if these switches are closed.

4,006,663
HYDRAULIC CONTROL MEANS, ESPECIALLY A STEERING MEANS

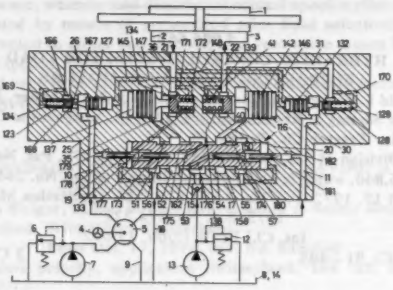
Johannes Vagn Baatrup, Sonderborg, and Thorkild Christensen, Nordborg, both of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Continuation of Ser. No. 438,003, Feb. 6, 1974, abandoned. This application Apr. 2, 1975, Ser. No. 564,278

Claims priority, application Germany, Feb. 7, 1973, 2305835

Int. Cl.² F15B *13/042*

U.S. Cl. 91—29 **1 Claim**



1. A hydraulic power steering subassembly comprising a reversible motor having complementary expansible chambers with first and second ports for said chambers, first control and power passages connected to said first port, second control and power passages connected to said second port, first control and power throttle slide valves in said first passages biased towards opening positions by pressurized fluid in said first passages, second control and power throttle slide valves in said second passages biased towards opening positions by pressurized fluid in said second passages, resilient means biasing said throttle slide valves towards closed position, a first pair of back-to-back piston means for pressure biasing said first throttle slide valves in opening directions, a second pair of back-to-back piston means for pressure biasing said second throttle slide valves in opening direction, the pressure responsive area of each of the piston means controlling the power throttle slide valves being greater than the area of the piston means controlling the control throttle slide valves, a first pulse line for transmitting pressure from said first power passage to a point between said second piston means to modulate the openings of said second throttle slide valves in accordance with the pressure in said first power passage, a second pulse line for transmitting pressure from said second power passage to a point between said first piston means to modulate the openings of said first throttle slide valves in accordance with the pressure in said second power passage.

4,006,664
STEERING SYSTEM INCLUDING TANDEM HYDRAULIC CYLINDERS WITH SELF-SYNCHRONIZATION

Wilburn Kelly Brown, Morton Grove, Ill., assignor to Pettibone Corporation, Chicago, Ill.

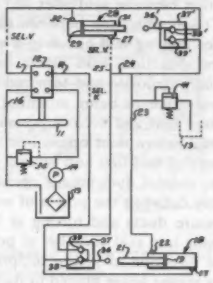
Filed Apr. 3, 1975, Ser. No. 564,868

Int. Cl.² F01B *25/04*; F15B *11/22*

U.S. Cl. 91—171 **2 Claims**

1. A steering system for use with front and rear steerable wheels, including a pair of cylinder-piston combinations, one for front-wheel steering and one for rear-wheel steering, having cylinders, each with a piston rod extending through at least one end, at times connected through a tandem line connecting a rod end of each to the other, steering valve means for reversably connecting the opposite ends at will to pressure and return lines respectively to operate either combination as a primary piston and cylinder, with development of a primary pressure therein, and the other as a secondary piston and cylinder operated by discharge from the primary cylinder, having the improvement which comprises:

a synchronizing valve assembly including a synchronizing valve having means biasing it to be normally closed; solely-mechanical means including one of said piston rods, extending from one of said pistons and engaging the syhchronizing valve to actuate said valve by force derived



from said one piston, when primary pressure moves said one piston to the extreme end of its movement, to supply pressure oil at the primary pressure through a check valve to the tandem line, thereby ensuring full movement of the other or secondary piston, said synchronizing valve being held open by said mechanical action until retraction of said one piston by pressure in the tandem line allows said synchronizing valve to close, said check valve preventing loss of pressure in the tandem line by outflow through the synchronizing valve while held open.

4,006,665
PERCUSSION TOOL

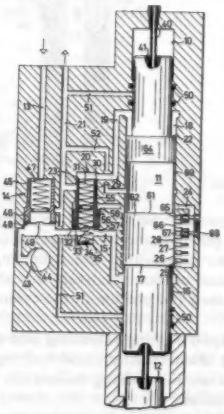
Günter Klemm, Olpe, Germany, assignor to Fa. Ingenieur Gunter Klemm Spezialuntrnehmen fur Bohrtechnik, Olpe, Germany

Filed May 1, 1975, Ser. No. 573,743

Claims priority, application Germany, June 11, 1974, 2428236; Dec. 27, 1974, 2461633

Int. Cl.² F01L *25/04*; F01B *7/18*

U.S. Cl. 91—278 **10 Claims**



1. A percussion tool comprising a housing defining a chamber within which is reciprocally mounted a piston, first and

second pressure ducts in fluid communication with said chamber at respective first and second sides thereof, a return duct in fluid communication with said chamber at a point intermediate the points of entry of said first and second pressure ducts relative to said chamber, an inlet duct for delivering a pressurized fluid to said pressure ducts, movable valve means for alternately placing said inlet and pressure ducts in fluid communication in a first position of said valve means for moving said piston in a first direction and placing said first pressure and return ducts in fluid communication in a second position of said valve means while at the same time maintaining fluid communication between said inlet and second pressure ducts and closing communication between said inlet and first pressure ducts for moving said piston in a second direction opposite said first direction, said piston being thereby movable between axially opposite and terminal first and second positions, said valve means being mounted for reciprocal motion in a bore, said first and second pressure ducts opening into said bore, said return duct opens into said bore between the points of entry of said first and second pressure ducts relative to said bore, control duct means opening into said bore at a point of entry between the points of entry of said return and second pressure ducts and having at least two branch duct means opening into said chamber at points spaced from each other in the direction of piston reciprocation, a first of said branch duct means being placed in fluid communication with said return duct through said chamber when said piston is in said first position, and a second of said branch duct means being placed in fluid communication with said second pressure duct when said piston is in said second position.

4,006,666

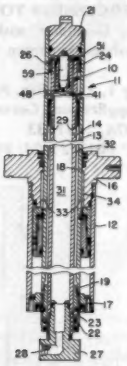
CUSHIONING DEVICE FOR A HYDRAULIC JACK

Kenneth R. Murray, Mentor, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

Filed May 22, 1975, Ser. No. 580,001

Int. Cl.² F15B *15/22;* **F01B** *15/02*

U.S. Cl. 91—394 **2 Claims**



1. In a hydraulic jack having an elongated cylinder with a closed end portion, and an elongated tubular inner member relatively movable within the cylinder, said inner member having an end portion relatively movable toward and away from the closed end portion of the cylinder, the improvement comprising:

a cup-shaped bushing extending into the end portion of the tubular inner member, said bushing having a blind bore formed therein opening toward the closed end portion of the cylinder;

a threaded connection securing the bushing to the end portion of the inner member;

means forming a threaded bore in the closed end portion of the cylinder in axial alignment with the blind bore;

an elongated plunger attached to the closed end portion including a stem having a threaded portion thereon threaded into the threaded bore for attaching the plunger to the closed end portion in axial alignment with the blind bore, a cylindrical sleeve floatingly mounted on the stem for telescopic entrance into the blind bore as the end portions approach each other and a pair of elastomeric rings disposed between the stem and the sleeve permitting limited radial movement of the sleeve relative to the stem; and

means for metering fluid expelled from the blind bore by the progressive ingress of the sleeve into the blind bore for cushioning the end of stroke movement of the hydraulic jack as the end portions approach each other.

4,006,667

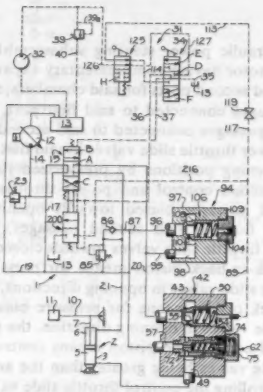
HYDRAULIC CONTROL SYSTEM FOR LOAD SUPPORTING HYDRAULIC MOTORS

Donald L. Bianchetta, Coal City; Kenneth R. Lohbauer, Joliet, and Sammy J. Rhodes, Aurora, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 437,383, Jan. 28, 1974, Pat. No. 3,906,840, which is a continuation-in-part of Ser. No. 244,822, April 17, 1972, Pat. No. 3,805,678. This application May 2, 1975, Ser. No. 574,229

Int. Cl.² F15B *11/08, 13/042*

U.S. Cl. 91—445 **3 Claims**



1. A load supporting fluid system comprising:

load supporting means including a fluid motor for raising and supporting a load, said motor having a load supporting end including a fluid chamber;

a source of pressurized fluid for operating said motor;

means including a pilot operated directional control valve for selectively communicating pressurized fluid between said source and motor for raising, lowering and positioning said load supporting means;

said directional control valve comprising a housing, a valve spool mounted in a bore in said housing for communicating with inlet and outlet ports for defining raise, lower, and hold positions;

load check valve means disposed between said control valve and said motor for permitting free flow of fluid from said control valve to said motor and for normally blocking flow of fluid from said motor to said control valve;

said check valve means having a control chamber including restriction means communicating with said load supporting chamber, and said check valve means being responsive to fluid pressure in said load supporting chamber to bias said valve means to said fluid blocking position; and

vent valve means including a valve spool mounted in a bore

coaxially with said directional control valve spool at one end thereof and engageable by abutment thereby upon shifting of said directional control valve spool to said lower position to vent said control chamber to effect opening of said check valve to permit flow of fluid from said load supporting chamber to effect lowering of said load supporting means, said vent valve means comprises a separate housing, means detachably securing said vent valve housing to said control valve housing, and said vent valve spool comprises a spring biased closed cylindrical spool having an annular groove for communicating between a first port in communication with said control chamber and a second port in communication with a sump, wherein said directional control spool is pilot operated by means of pressurized pilot fluid selectively directed to either end thereof, said vent valve means being exposed to said pilot fluid and

said vent valve spool includes pressure balancing means for preventing actuation thereof by said pilot fluid.

4,006,668

HYDROSTATIC PISTON MACHINE HAVING A CYLINDRICAL MOUNTING PIN

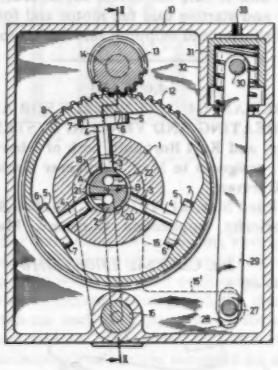
Anton Steiger, Illnau, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Oct. 17, 1974, Ser. No. 515,540

Claims priority, application Switzerland, Oct. 23, 1973, 14907/73

Int. Cl.² F01B *13/06*

U.S. Cl. 91—497 **5 Claims**



1. A hydrostatic piston machine comprising

a casing having a pair of opposed sidewalls, each sidewall having an aperture coaxially aligned with the aperture in the other sidewall;

a pin passing through said apertures and said casing and having a longitudinal axis;

a cylinder block within said casing rotatably mounted on said pin about said axis;

a guide member rotatably mounted about said pin in said casing, said guide member having guide surfaces disposed tangentially with respect to a circular cylinder having a second axis eccentric to said axis of said pin;

a plurality of pistons movably mounted in said cylinder block radially of said block, each said piston having a foot at an outer end, each said foot having a plane bearing surface disposed in guided relation on a respective guide surface of said guide member; and

a guide means at each end of said pin on the outside of said casing mounting said pin relative to said casing for adjusting the eccentricity of said pin axis to said second axis, said guide means including a pair of pivotally mounted interconnected levers, each lever receiving one respective end of said pin therein.

4,006,669

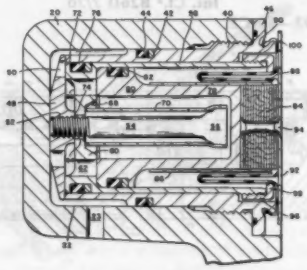
PISTON AND EXTENSIBLE CYLINDER THEREFOR

William G. Price, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Filed May 19, 1975, Ser. No. 578,693

Int. Cl.² F01B *31/14*; F15B *15/24*

U.S. Cl. 92—13.1 **4 Claims**



1. Fluid pressure actuated piston means and extensible cylinder means therefor comprising:

a casing having a cavity therein;

cylinder means slidably disposed therein and responsive to a pressurized fluid supplied to said cavity;

a piston slidably contained by said cylinder and responsive to said pressurized fluid;

stop means operatively engaged with said cylinder for resisting axial movement of said cylinder and adapted to be overcome in response to a predetermined pressure of said fluid to allow axial movement of said cylinder relative to said piston in response to said pressurized fluid;

said stop means includes a deformable member engageable with said cylinder means; and

a fixed deforming member engaged by said deformable member for deforming said deformable member in response to said predetermined pressure of said fluid acting against said cylinder means.

4,006,670

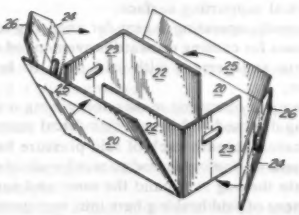
METHOD AND APPARATUS FOR FORMING A COLLAPSED BOX

Thomas B. Royal, Homestead, Fla., assignor to International Paper Company, New York, N.Y.

Filed Dec. 20, 1974, Ser. No. 534,710

Int. Cl.² B31B *5/00*

U.S. Cl. 93—53 M **26 Claims**



1. The method of forming a box from a flat blank having a bottom panel, side panels connected to opposite sides of said bottom panel, end panels connected to opposite ends of said bottom panel, a pair of side flaps each connected to a respective one of said end panels, and a pair of end flaps each connected to a respective one of said side panels which comprises:

a. folding said side flaps and said end panels around a stationary mandrel;

b. moving said blank downwardly while folding said side panels and said end flaps; and

c. squeezing together said end flaps and said end panels.

4,006,671

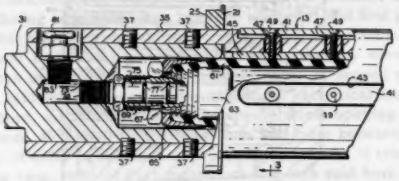
CORRUGATOR

Gordon M. Ochs, Washougal, Wash., assignor to Tidland Corporation, Camas, Wash.

Filed Mar. 6, 1975, Ser. No. 555,792

Int. Cl.² B26D *7/26*

U.S. Cl. 93—59 CE **3 Claims**



1. A support apparatus for use in a machine performing mechanical operations on sheet material fed through an operating zone of the machine, said support apparatus comprising a rigid hollow cylindrical support member mounted for rotation in said operating zone in proximity to the sheet material fed through said zone, wherein said support member has an exterior cylindrical supporting surface,

a plurality of operating rings on said cylindrical support member each of which has a sliding fit with said cylindrical supporting surface and has an operating edge for performing mechanical operations on sheet material fed therepast;

said sliding fit enabling said rings to be slid along said cylindrical supporting surface to desired longitudinal positions with respect to the sheet material and to be rotated relative to said support member,

a plurality of pressure bar means mounted for movement to a locking position for simultaneously locking said rings against movement with respect to said support member to hold said rings so that the operating edges of said rings can cooperate with the operating edges of rings on an adjacent support apparatus to perform the desired mechanical operations on sheet material fed through the operating zone of the machine and for movement to a release position so that said rings are free to both rotate relative to said support member and slide along said cylindrical supporting surface;

each of said pressure bar means comprising a braking bar which underlies a number of said rings and which is disposed in a separate lengthwise groove formed in said cylindrical supporting surface;

and pneumatic operating means for engaging said pressure bar means for causing outward movement of said braking bars into engagement with said rings to hold them in position;

said pneumatic operating means comprising a single inflatable bag disposed within said cylindrical support member and located beneath each of said pressure bar means,

wherein said air bag is adapted to receive air under pressure to inflate the bag to expand the same and cause outward movement of said braking bars into engagement with the overlying rings,

each of said braking bars having an operating face which is faced with a friction material,

each of said pressure bars means also including a leaf supported by said air bag and a plurality of spacers the spacers for each leaf being each connected at one end to said leaf and extending outwardly through an opening which communicates between the hollow interior of said support member and the bottom of the associated groove and is connected at the other end to the associated braking bar.

4,006,672

VENTILATION FAN (VENTILATION SYSTEM)

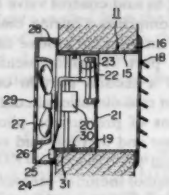
Masaya Matsuyoshi, Nagoya, and Isao Hirano, Kasugai, both of Japan, assignors to Matsushita Seiko Co., Ltd., Japan

Filed Dec. 4, 1975, Ser. No. 637,710

Claims priority, application Japan, July 31, 1975, 50-94047

Int. Cl.² F24F *13/08*

U.S. Cl. 98—39 **2 Claims**



1. A ventilation fan assembly for the wall of a building comprising a duct frame rectangular in cross section, an outside louver attached to an outside opening of said duct frame, said duct frame being fitted into a ventilation hole from the outside of said building; a ventilation fan frame, connection means for telescopically fitting said fan frame into said duct frame from the outside of said building, screws in the walls of said fan frame for securing the fan frame with respect to the duct frame, an exhaust fan installed in said ventilation fan frame, a shutter in said ventilation fan frame on the leeward side of said fan, and control means operatively connected to said shutter and to said fan motor for concurrently opening said shutter and starting said fan motor and for concurrently closing said shutter and stopping said fan motor.

4,006,673

ADJUSTABLE AIR OUTLET NOZZLE FOR AUTOMOBILE HEATING AND VENTING SYSTEMS

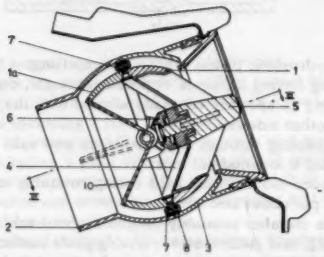
Ernst Meyer, and Karl Burghoff, both of Oberursel, Taunus, Germany, assignors to Max Kammerer GmbH, Oberursel, Taunus, Germany

Filed Mar. 21, 1975, Ser. No. 560,940

Claims priority, application Germany, Mar. 21, 1974, 2413628

Int. Cl.² F24F *13/06, 13/10*

U.S. Cl. 98—40 A **10 Claims**



1. An adjustable air outlet nozzle, especially suited for automobile heating and venting or air-conditioning systems, comprising in combination:

a generally tubular stationary connector housing having a length portion defining a lodgement with a spherical inner guide surface of enlarged diameter;

a generally tubular nozzle shell received inside the lodgement of the connector housing, the nozzle shell having an outer surface in the shape of a bilaterally truncated sphere which is concentrically spaced from the guide surface of the lodgement so as to define a radial gap therewith;

a double-clappet valve mounted inside the nozzle shell on a transverse pivot shaft arranged in the vicinity of the center of the above-mentioned spherical surfaces, said valve comprising two generally flat clappets attached to axially adjacent clappet hubs and a bevel gear solidary with each clappet; the valve clappets being pivotable between an open position in which they point generally upstream, to the inside of the nozzle, and a closed position in which they are spread apart so that their rims contact the nozzle shell;

a wing knob on the downstream, outer side of the nozzle shell rotatably received inside the latter in alignment with the shell axis, the wing knob having a drive bevel gear attached thereto and arranged to mesh with both of said clappet bevel gears; and

a gimbal ring disposed in the radial gap between the housing lodgement and the nozzle shell, said gimbal ring including means for universally pivoting the nozzle shell in relation to the connector housing.

4,006,674

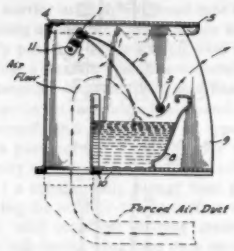
HUMIDIFIERS FOR FORCED AIR SYSTEMS

Charles V. Culver, 729 Mingus Ave., Prescott, Ariz. 86301

Continuation-in-part of Ser. No. 418,784, Nov. 23, 1973, abandoned. This application Apr. 14, 1975, Ser. No. 552,427

Int. Cl.² F24F *13/00*

U.S. Cl. 98—105 **10 Claims**



1. A humidifier comprising (A) a housing having an air inlet opening for communication with a source of forced air, an air outlet opening, and a water reservoir positioned therebetween with the water level thereof defining with the interior of said housing a rectilinear and main passageway for air between said air inlet and said air outlet, and (B) a thin, flexible and substantially air-impervious curtain mounted on a rectilinear support and (a) suspended from said support within and across said passageway upstream from said air outlet to constitute a freely-moving barrier substantially blocking air flow between said air inlet and said air outlet, and (b) having at least symmetrical portions of its lower edge weighted rectilinearly and adapted to extend into said reservoir beneath the water level thereof, whereby forced air entering said air inlet balloons and flexes said curtain to gently and pulsatingly elevate at least a part of its lower edge above the water surface in order to escape to said air outlet.

4,006,675

FRYING BASKET WITH MOVABLE SHELVES

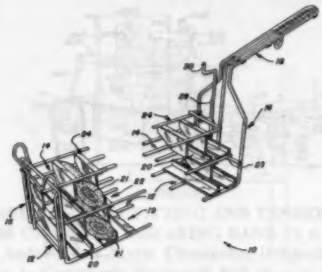
Etchison G. Lill, Wheaton, Ill., assignor to Restaurant Technology, Inc., Oak Brook, Ill.

Filed Jan. 26, 1976, Ser. No. 652,389

Int. Cl.² A47J *37/12*

U.S. Cl. 99—417 **11 Claims**

1. In a frying basket for supporting food to be cooked in an immersed position in a cooking medium, said frying basket having an open-framed base supporting an open-framed back wall and two opposing open-framed end walls; a carrying handle mounted on said frying basket; food shelf means on said base for carrying food; said frying basket defining an accessible front food loading area opposite said back wall; an open-framed retaining cover disposed parallel to, and above, said food shelf for preventing food from rising off said shelf in a food retaining position and being movable away from the shelf; and latching means mounted on said frying basket movable from a first latching position in which said retaining cover



is maintained in said food retaining position to a second unlatched position in which said cover may be moved away from said shelf to a second position spaced away from said shelf to facilitate the removal of food from said frying basket, said latching means being returnable to said first latching position to support said cover in said second position as food is being removed.

4,006,676

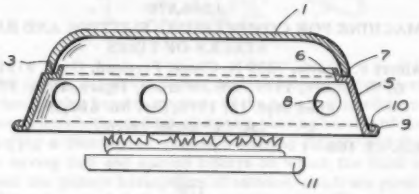
CREPE-MAKING PAN AND SUPPORT

Robert J. Adamis, San Mateo, Calif., assignor to Atlas Metal Spinning Company, San Francisco, Calif.

Filed Dec. 19, 1975, Ser. No. 642,403

Int. Cl.² A47J *37/10*

U.S. Cl. 99—422 **2 Claims**



1. In combination a pan having a convex bottom and a concave interior,

and a spacer band at the concave side of the pan adapted to surround a heating source,

said band having spaced vents around its periphery for even distribution of the heat along the concave surface of the pan,

and a manipulating handle extended from the outer periphery of said pan,

said band having a shoulder extended inwardly from the outer periphery of the top of the band on which the rim edge of the concave side of the pan rests,

and having an annular retaining flange spaced inwardly from the outer periphery of the band and extending from said shoulder into the concave side of the pan adjacent the rim thereof to prevent significant movement of said pan;

and the distribution of weight of said pan and said handle being such that the center of gravity of said pan when resting on said shoulder is within the area of said band,

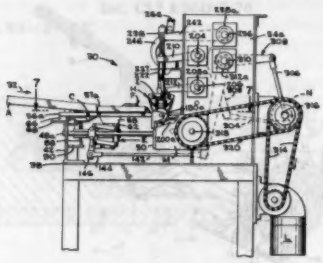
the handle having a heat insulating grip thereon.

4,006,677

PEACH REPITTING MACHINE

Leslie Vadas, Los Gatos, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed June 23, 1975, Ser. No. 589,501
Int. Cl.² A23N 4/12; A27J 25/00; A23N 4/24
U.S. Cl. 99—549 15 Claims



1. A peach pitting machine for removing the pits from peach halves at a pitting station comprising:

a. means for assembling leading and trailing peach halves flat side down in a position upstream of the pitting station;

b. reciprocable means for lifting the leading peach half from said assembling means in said upstream position;

c. means for isolating the trailing peach half from said reciprocable means as the latter lifts said leading peach half;

d. means for moving said reciprocable means and the leading peach half toward said pitting station during a first cycle of operation;

e. said reciprocable means in the following cycle of operation pushing the leading peach half to said pitting station; and

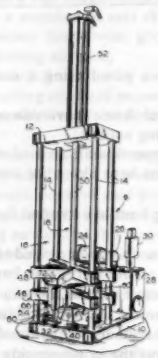
f. pitting means for removing the pit from the leading peach half at said pitting station.

4,006,678

MACHINE FOR COMPRESSING, SLITTING AND BALING STACKS OF TIRES

Albert F. Laurie, 7239 N. Chase, Portland, Oreg. 97217, and G. W. Bunch, 11775 SW. Warner, Tigard, Oreg. 97223

Filed Sept. 18, 1975, Ser. No. 614,550
Int. Cl.² B65B 13/20
U.S. Cl. 100—1 15 Claims



1. A machine for compressing, slitting and baling a stack of rubber tires comprising:

first vertically movable platen means supportable in an upper limit position above a stack of tires to be compressed,

second vertically movable platen means supportable in an upper limit position spaced above said first platen means,

knife means projecting downwardly from said second platen means towards vertically aligned openings in said first platen means permitting passage of said knife means below said first platen means upon downward movement of said second platen means relative to said first platen means,

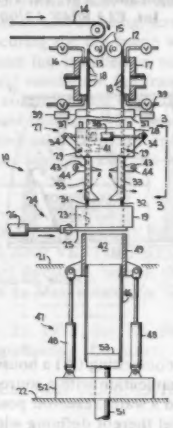
pressure-applying means for moving said second platen means downwardly towards said first platen means such that said second platen means applies a downward moving force to said first platen means and approaches said first platen means to project said knife means below said first platen means whereby said stack is simultaneously slit and compressed as said first and second platen means move downwardly against said stack.

4,006,679

OPPOSED BOX BALING PRESS

Isaac Egosi, Kiryat Mozkin, Israel, assignor to Effic Trading and Services Ltd., Zurich, Switzerland

Filed Aug. 11, 1975, Ser. No. 603,380
Int. Cl.² B30B 7/00
U.S. Cl. 100—138 11 Claims



1. A baling press arrangement for forming bales of fibrous material, comprising:

a first receptacle open at one end for the reception of the fibrous material and having a discharge opening at its opposite end;

means for continuously conveying the fibrous material into said first receptacle through said one end;

packing means axially movable along said first receptacle and being reciprocable therealong in short strokes while being movable progressively from said opposite end toward said one end, said packing means including elements projecting into and out of opposite sides of said first receptacle for continuously pre-packing the fibrous material therein in incremental amounts during the progressive movement thereof;

compression means disposed co-axially with said first receptacle and including a compression chamber located adjacent said discharge opening;

shiftable gate means disposed between said opposite end and said compression chamber for opening and closing said discharge opening;

said packing means being movable toward said discharge opening so as to permit said elements to discharge a pre-packed bale of fibrous material of a predetermined size through said opening and into said compression means;

said compression means further including a piston means for compressing the pre-packed fibrous material in said compression chamber to form compact bales; and means shifting said compression chamber away from said gate means for exposing the compact bales for removal.

4,006,680

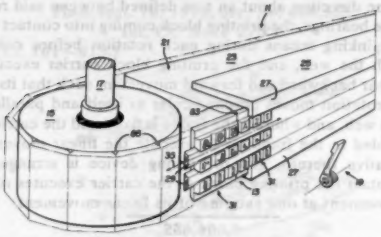
TYPE CARRIER BELT FOR A PRINTER

Louis Grace, Jr., 34795 Pratt Road, and Richard L. Grace, 81630 Belle River Road, both of Memphis, Mich. 48041

Filed Mar. 19, 1976, Ser. No. 668,353

Int. Cl.² B41J *1/20*

U.S. Cl. 101—93.14 **37 Claims**



1. A type carrier assembly formed into an endless loop for use in a printing apparatus having means for rotatably driving said assembly past a printing station, said type carrier assembly comprising: a flexible elastomeric band having a trapezoidal non-rectangular cross-section, said band including means imbedded therein for reinforcing said band and controlling the elasticity thereof; and a plurality of type carrier segments disposed in a predetermined side-by-side relationship and in close proximity to adjacent segments, each of said segments including (1) a substantially planar base portion having one surface forming the interior-facing surface of said endless loop for engaging said rotatable driving means, (2) means for mounting an indicia-carrying face on a second surface of said base portion, and (3) means forming a dove tail-like slot in the surface of said base portion opposite said one surface for engagably receiving and resiliently retaining said elastomeric band therein.

4,006,681

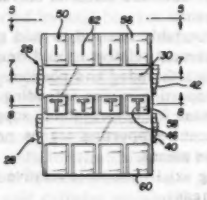
ENDLESS TYPE FLEXIBLE SUPPORT BELT FOR A HIGH SPEED PRINTER

Louis Grace, Jr., and Richard L. Grace, both of Memphis, Mich., assignors to Grace Engineering, Inc., Memphis, Mich.

Filed July 9, 1975, Ser. No. 594,211

Int. Cl.² B41J *1/20*

U.S. Cl. 101—111 **13 Claims**



1. A character support for use in a printing apparatus comprising a plurality of generally cylindrical elongated segments each having a longitudinal axis and at least two grooves substantially normal to said axis, said elongated segments being arranged in a predetermined side by side relationship and in close proximity to one another with the axes of said segments being parallel and said grooves aligned, each segment having a type character area, and said support including bonding means disposed within said grooves and between said segments for maintaining said predetermined relationship between said segments.

4,006,682

ARRANGEMENT FOR FITTING AND TENSIONING AN ENDLESS CHARACTER-BEARING BAND IN A PRINTER

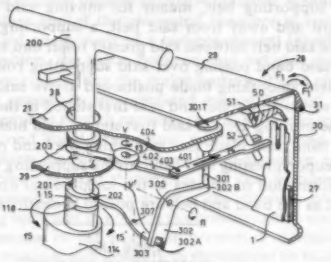
Jacques Andre Louis Marie Chambolle, Danjoutin, France, assignor to Compagnie Honeywell Bull (Societe Anonyme), Paris, France

Filed Dec. 1, 1975, Ser. No. 636,455

Claims priority, application France, Dec. 11, 1974, 74.40831

Int. Cl.² B41J *1/20*

U.S. Cl. 101—111 **10 Claims**



1. An arrangement for fitting and tensioning an endless character-bearing band in a printer of the type having a framework and wherein the endless character-bearing band is of the type having a plurality of character-bearing fingers and the printer having first and second pulleys on which the band is mounted, the pulleys having axes of rotation which are parallel with the distance between the axes of rotation being adjustable between a position in which the pulleys are closed-up and the band is not under tension and a position in which the pulleys are opened-out and the band is under tension, the printer being of the type of having means for adjusting the spacing of the first and second pulleys and a protective member hinged to the framework of the printer for protecting the character-bearing fingers by covering the top of said fingers, said arrangement including a detachable cartridge containing the band and being operatively associated with said means for adjusting the spacing of the pulleys; the improvement residing in said fitting and tensioning arrangement further including operating means connected to said protective member for operating said protective member, locking means, actuating means for actuating said means for adjusting the spacing of the pulleys, said locking means including means preventing the use of said actuating means in the absence of a cartridge in the printer, said locking means further including means actuated in response to the positioning of a cartridge for moving said locking means to a released position, said operating means including means engageable by said actuating means for operating said operating means to move said protective member above the top of said character-fingers.

4,006,683

ROTARY SCREEN PRINTING MACHINE

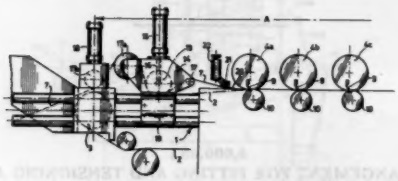
Jacobus Gerardus Vertegaal, Boxmeer, Netherlands, assignor to Stork Brabant B.V., Boxmeer, Netherlands

Filed Oct. 15, 1974, Ser. No. 515,027

Claims priority, application Netherlands, Oct. 31, 1973, 7314974

Int. Cl.² B41F 15/10, 15/12

U.S. Cl. 101—118 3 Claims



1. In a rotary screen printing machine, a frame, means on said frame for driving and guiding an endless supporting belt along a path, means on said frame for rotatably supporting a plurality of thin-walled cylindrical screen stencils along said path, means for feeding a band of material to be printed onto the path of said supporting belt before the first of said plurality of stencils, a presser roller in said supporting belt path before said first stencil to press said band of material upon said supporting belt to synchronize the movement of said band and said supporting belt, means for moving said presser roller toward and away from said belt, a supporting roller spaced above said belt between said presser roller and said first stencil and said band passing over said supporting roller, and a thin resilient smoothing blade positioned above said belt between said supporting roller and said first stencil in the close vicinity of the printing area of said first stencil, said blade acting upon said band, said blade first smoothing the band of material and thereupon pressing said band on the supporting belt to prevent the formation of creases in the longitudinal direction of said band as the band and belt are possed beneath said first stencil.

4,006,684

PRINTING MACHINE

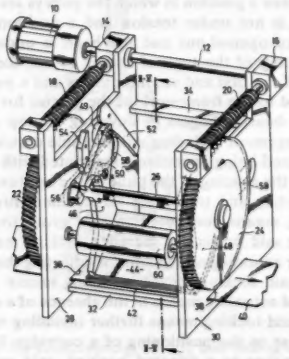
Roland Melzer, Schwelm, Germany, assignor to R. Melzer oHG Machinenbau u. Metallverarbeitung, Schwelm, Germany

Filed Nov. 18, 1975, Ser. No. 633,156

Claims priority, application Germany, Nov. 22, 1974, 2455382

Int. Cl.² B41F 5/04

U.S. Cl. 101—212 12 Claims



1. A printing machine for printing on a discontinuously moved, flat web comprising

a frame;

a counter pressure plate mounted on said frame over which said discontinuously moved flat web passes;

means in said frame forming guide tracks which extends parallel to the counter pressure plate;

a printing block carrier having a curved jacket upon which a printing block is mounted, said carrier being journalled to rotatable bearings which are slidably positioned in said guide tracks;

drive means connected to said printing block carrier to cause rotation of the carrier about the axis defined by said bearings and to move said bearings in said guide tracks so that said printing block rolls over said web lying on said counter pressure plate; and

inking means stationarily mounted on said frame;

wherein, in use, the printing block carrier rotates in the same direction about an axis defined between said rotatable bearings, the printing block coming into contact with the inking means during each rotation before contact with the web, and the printing block carrier executing linear backward and forward movement such that its axis of rotation moves perpendicular to itself and parallel to the web, and wherein the frame is fixed and the carrier so guided in the frame as to execute the linear movement relative thereto, and the inking device is arranged to contact the printing block as the carrier executes rotary movement at one extreme of its linear movement.

4,006,685

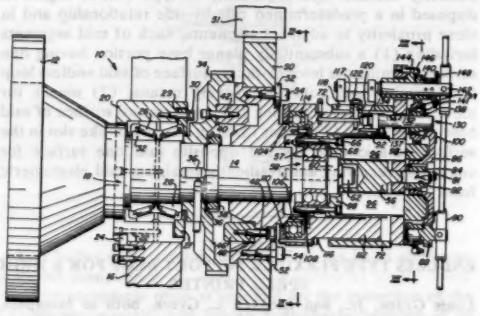
AXIAL AND CIRCUMFERENTIAL REGISTER CONTROL APPARATUS FOR A CYLINDER IN A PRESS FRAME

Robert L. Mosemiller, Pittsburgh, Pa., assignor to Miller Printing Machinery Co., Pittsburgh, Pa.

Filed Sept. 22, 1975, Ser. No. 615,596

Int. Cl.² B41F 13/24

U.S. Cl. 101—248 19 Claims



1. Apparatus for adjusting the position of a cylinder in a press frame comprising,

a cylinder having a shaft end portion,

frame means for rotatably supporting said shaft end portion, said cylinder mounted for axial movement relative to said frame means,

a housing rotatably secured to said shaft end portion for axial movement relative to said frame means, said housing having a threaded end portion,

adjacent supporting means extending outwardly from said frame means for non-rotatably supporting said housing, said adjacent supporting means non-rotatably fixed to said frame means,

said housing axially movable relative to said adjacent supporting means,

resilient means for axially moving said housing in a preselected direction relative to said adjacent supporting means, said resilient means positioned within said housing and having one end portion fixed to said adjacent supporting means and the other end portion abutting said housing, and

adjustment means secured to said housing threaded end portion and rotatably fixed to said adjacent supporting means for axially moving said housing in a preselected direction relative to said frame means,

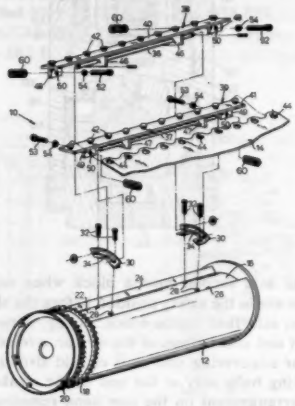
said adjustment means operable to axially move said housing in one direction and thereby axially move said cylinder in a corresponding direction and to axially move said housing in an opposite direction and thereby move said cylinder in a corresponding direction.

4,006,686

BLANKET FASTENING MEANS FOR A CYLINDER BLANKET

Stephen P. Ackerman, 244 Elmwood Drive, Mundelein, Ill. 60060

Filed Sept. 18, 1975, Ser. No. 614,555
Int. Cl.² B41F 27/12
U.S. Cl. 101—415.1 5 Claims



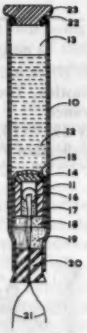
1. A blanket hooking means for securing a blanket around a blanket cylinder having a longitudinal axis and including a cylindrical outer surface and wherein said blanket cylinder includes a narrow elongated longitudinal cylinder opening in said cylindrical outer surface extending parallel to the axis of the cylinder and having longitudinally extending generally opposed cylinder opening walls defining generally radially extending planes with respect to the longitudinal axis of said cylinder and intersecting the cylindrical outer surface and wherein said blanket includes opposite ends and a plurality of aligned slots in said ends, said blanket hooking means comprising: bracket means removably secured to said blanket cylinder and disposed within said cylinder opening between said cylinder opening walls, a pair of elongated longitudinally extending blanket hooking members supported adjacent to said cylinder opening walls and in spaced parallel relationship to each other, at least one of said blanket hooking members being slidably supported by said bracket means for slidable movement toward and away from one of said cylinder opening walls, said hooking members including a plurality of projecting blanket securing projections aligned parallel to the longitudinal axis of said cylinder for receiving said aligned slots in the ends of said blanket, and means for adjustably forcing said at least one blanket hooking member away from said one of said cylinder opening walls for stretching said blanket around said cylinder, said bracket means including a pair of arcuate brackets received in said cylinder opening in longitudinally spaced apart relationship, said arcuate brackets each including an arcuate slot therein, and wherein said hooking members each include a rod secured thereto, said rod being slideably supported by the pair of arcuate brackets in said arcuate slots whereby each of said hooking members is slideable along said slot.

4,006,687

SAFE DETONATOR DEVICE

John Jerold Ridgeway, Paris, France, assignor to Imperial Chemical Industries Limited, London, England

Filed Nov. 15, 1974, Ser. No. 524,269
Int. Cl.² F42B 3/12
U.S. Cl. 102—28 R 21 Claims



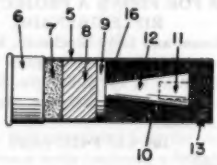
1. In a detonator device an elongated container defining an elongated chamber, removable stopper means closing one end of said container, said stopper means having an outer end portion which projects outwardly of said container to facilitate removal of the stopper means, explosive initiator means located in the other end of the elongated chamber in contact with a first liquid component of a two-component liquid explosive composition, the space between said initiator means and said stopper constituting the major portion of said chamber and being essentially unobstructed except for said first liquid component and of such capacity to provide ullage space to enable a second liquid component, mixable with said first component to form the two-component liquid explosive, to be added upon removal of the stopper, to said first component and mixed therewith in the container, the strength of the container being sufficient to contain the pressure generated by the initiator means in the event of premature detonation thereof and to transmit said pressure to the stopper so that the latter and the first component are expelled from the container.

4,006,688

SHOT DISPERSION CONTROL DEVICE FOR SHOTGUN SHELLS

William J. Craft, Rte. 1, P.O. Box 668, Greensboro, N.C. 27406, and Carroll B. Williams, P.O. Box 333, Banner Elk, N.C. 28604

Filed June 4, 1975, Ser. No. 583,600
Int. Cl.² F42B 7/02
U.S. Cl. 102—42 R 6 Claims



1. A shotgun shell containing a shot dispersion control device comprising; a base casing, a cylindrical body extended from said casing, a powder charge and wadding positioned in said base casing, a shot dispersion control device positioned in said cylindrical body intermediate its length, and shot surrounding said device, said device having stabilizing means at one end thereof, a longitudinal member having a surface of

which a major portion monotonically increases from said stability means, said longitudinal member having an end opposite said stability means, said opposite end including a recess therein for receiving shot, whereby shot surrounding said longitudinal member will be dispersed upon firing depending upon the monotonical increase of said longitudinal member's outer surface.

4,006,689

PYROTECHNICAL SAFETY RELAY

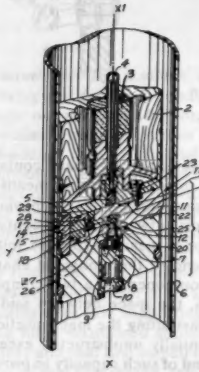
Robert Guy Emile Bastide, Toulon, France, assignor to Etat Francais, Paris, France

Filed July 29, 1975, Ser. No. 600,094

Claims priority, application France, Aug. 1, 1974, 74.26707

Int. Cl.² F42C *15/20, 9/10*

U.S. Cl. 102—70 R **8 Claims**



1. A pyrotechnical safety relay for controlling the firing of a main pyrotechnical charge carried by a projectile launched from a tube, said relay comprising a finger slidable in a transverse bore provided in the projectile, said finger having an initial inoperative position and a displaced operative position, the bore having an open extremity and a closed extremity, said finger having a blind longitudinal bore containing an auxiliary pyrotechnical charge and an opening at the extremity of the finger situated adjacent said closed extremity of said transverse bore, means for igniting said charge in the blind bore with said finger in said initial inoperative position such that the finger is displaced to said operative position, and means for igniting the main pyrotechnical charge from the auxiliary pyrotechnical charge with the finger in displaced operative position.

4,006,690

MECHANISM FOR FIRING A PROJECTILE SUCH AS A RIFLE GRENADE

Suzanne Stockman, and Leon Stockman, both of 156, avenue des Aubepines, 1180 Brussels, Belgium

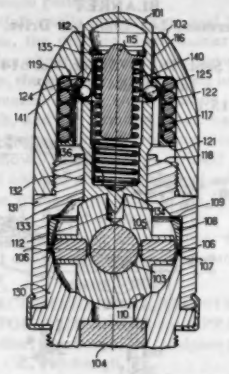
Filed May 6, 1975, Ser. No. 575,015

Claims priority, application Belgium, May 6, 1974, 143966; Apr. 23, 1975, 155660

Int. Cl.² F42C *15/26*

U.S. Cl. 102—80 **12 Claims**

1. In a projectile such as a rifle grenade, a firing device comprising a striker placed along the center line axis of said projectile and projecting from the latter at the front end thereof, a detonator associated with said striker and fired by the latter when the front end of the projectile hits upon an obstacle and a charge ignited by the detonator, said detonator being movable between two positions the first one of which is a safety position whereas the second one is an operative working position enabling to ignite the charge, said detonator being kept in said first position by said striker retracted into said projectile and retained by a locking arrangement which is unlocked through inertial effect when the projectile has been shot, wherein said locking arrangement comprises a first inertia block movable within said striker between a front abutment and the bottom of said striker, a calibrated return spring for urging said inertia block towards said abutment, a second cylindrical annular inertia block surrounding said striker within said projectile and movably mounted between a front shoulder and a rear shoulder of the body of said projectile, slots extending through the body of said striker for receiving locking balls held within said slots between said first inertia



block and said second inertia block when said striker and detonator are in the safety position before the shooting of said projectile, said first inertia block having, between said front abutment and said bottom of the striker, a relatively very long stroke for uncovering said slots of said striker and releasing said locking balls only at the end of the stroke, so that said locking arrangement on the one hand remains insensitive to very violent and short accelerations such as those induced by a shock before shooting said projectile and on the other hand releases said detonator only after a bounce at the end of a shooting acceleration thereby enabling said detonator to be in an operative working position at the end of a constant and predetermined time period after shooting of said projectile.

4,006,691

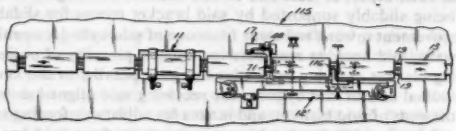
TRAIN HOLDING DEVICE

Ivan R. Kacir, Highland Heights; Edward T. Manning, Jr., Bay Village, and Donald A. Schmieley, Brook Park, all of Ohio, assignors to McDowell-Wellman Engineering Company, Cleveland, Ohio

Filed June 11, 1975, Ser. No. 586,057

Int. Cl.² B61B *9/00;* **B61J** *3/06;* **B61K** *7/16*

U.S. Cl. 104—176 **10 Claims**



1. Apparatus for handling the cars of a train at a work area, comprising a train positioner station and a train holding station, said train positioner station including a carriage and a guideway for guiding the carriage along a path adjacent and parallel to the tracks of the train, an arm mounted on the carriage and movable from a retracted position out of the path of the train to an extended position, said arm including means for controlling the position of a car when said arm is in its

extended position, means to drive the carriage along the guideway with the arm extended to index the train a unit distance equal to one or more car lengths and return the carriage to a rest position with the arm retracted, said holder station including a stationary base, an arm movable in a vertical plane from a retracted position out of the path of the train to an extended position between a pair of coupled cars, said holder arm having a coupler engaging head, said head having means to prevent significant trackwise movement of said train in either direction when it is in engagement with a car coupler, and means responsive to the positioning of a car at the completion of an indexing stroke to initiate extension of the holding arm and engagement of its head with an adjacent coupler.

4,006,692

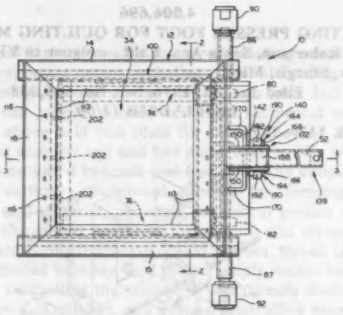
HOPPER CAR OUTLET GATE AND SEAL

Osvaldo F. Chierici, Elmhurst, Ill., assignor to Holland Company, Lombard, Ill.

Filed May 2, 1975, Ser. No. 573,807

Int. Cl.² B61D *7/20, 7/22, 7/26, 49/00*

U.S. Cl. 105—282 P **6 Claims**



1. In a hopper outlet gate assembly for bulk material carrying railroad hopper cars in which the car hopper has a discharge opening, with the assembly including a frame having four planar sheets in downwardly converging relation and forming a funneling portion terminating in an outlet port of quadrilateral configuration, a gate for closing the port, a slideway for the gate, which slideway extends sidewise and across the outlet port, and means for moving the gate longitudinally of the slideway between a first position in which it is disposed across the port to close same and a second position in which it is disposed to one side of the port and away from overlapping with the port to render the port fully open for discharge of the bulk materials therefrom,

the improvement including:

a seal stripping secured to said funneling portion about the port and disposed adjacent to but above the port and the slideway for forming a top seal for the gate,

said stripping being of open centered quadrilateral configuration defining rectilinear sides merging into corners at adjacent ends of the stripping sides, which corners respectively complement corners defined by said sheets,

said stripping defining thereabout a lip portion disposed about the port defining a flap that projects centrally of the port and that is disposed about the port for sliding engagement with the upper side of the gate when the gate is moved between its said positions,

said flap defining an upwardly facing side adapted to be engaged by the lading when in the funneling portion, and a downwardly facing side disposed for face to face sealing engagement with the gate said upper side when the gate is in its said first position,

said gate comprising a planar member of molded one piece construction formed from an ultra high molecular weight polymer having self lubricating characteristics and characterized by its surfacing being resistant to adherence thereto of the bulk material,

with said gate upper side being substantially planar across the length and width of same and said gate under side being in sliding engagement with said slideway for movement therealong by said gate moving means between said positions thereof,

said gate and said stripping flap being disposed in parallel planes extending transversely of said funneling portion,

with said stripping flap being formed from resiliently flexible plastic material,

said stripping being formed to bias said flap against the gate upper surface for wiping engagement therewith for effecting said sealing engagement with said gate upper side when said gate is disposed in vertical alignment with said flap,

said gate having formed in the underside of same rack means extending parallel to said slideway and that are free of engagement with said slideway,

gear means journaled in said frame and meshing with said rack means,

and means for revesibly rotating said gear means to move said gate between said positions thereof,

said rack means, said gear means, and said gear reversibly rotating means comprising said gate moving means,

whereby said gate is free from adherence of the bulk materials carried by the car adhering thereto, and said stripping flap wipes the gate said upper side free of the bulk materials free of disturbence of said flap sealing engagement when the gate is moved from said first position to said second position by said gate moving means,

and effect the case of moving same from said first position when the car hopper is loaded with bulk material, under the gravity biasing action of the bulk material on said top seal and on said gate upper side within the confines of said stripping.

4,006,693

COMBUSTION FURNACE CONSTRUCTION PARTICULARLY A REFUSE INCINERATOR

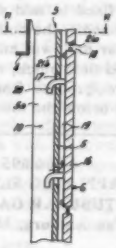
Hans Künstler, Eulenweg 25, Zurich, Switzerland (8048)

Filed Nov. 15, 1973, Ser. No. 416,235

Claims priority, application Switzerland, Nov. 30, 1972, 17496/72

Int. Cl.² F23G *5/00;* **F23L** *1/00, 9/00*

U.S. Cl. 110—8 R **10 Claims**



1. A combustion furnace particularly for refuse incineration, comprising furnace walls enclosing a fire chamber having a grate extending across at least a portion of the fire chamber above the bottom thereof, said furnace walls having a portion adjacent said grate comprising inner and outer spaced metal walls with a hollow space between said walls, a metal shield plate spaced inwardly from said inner furnace wall and extending around at last the substantial portion of the periphery of said grate which is adjacent said furnace walls and defining an intermediate hollow space between said shield plate and said inner furnace wall, said inner metal wall having openings

communicating said hollow space with the space between said inner wall and said shield plate, said shield plate having openings communicating the intermediate space between said shield plate and said inner furnace wall with said fire chamber, and air supply means for supplying air into the hollow space between said inner and outer metal walls.

4,006,694

HAND HELD TUFTING MACHINE

Fred A. Thaheld, and Fred H. Thaheld, both of Minden, Nev., assignors to Rumplestiltskin's Craft Shop, Inc., Portland, Oreg.

Filed June 12, 1975, Ser. No. 586,264
Int. Cl.² D05C *15/06*
U.S. Cl. 112—80 **2 Claims**

1. In a hand powered tufting machine adapted to be manually supported and guided over a base fabric, the combination of: a support plate, a manual crank and gearing driven thereby mounted on one side of said support plate, a rotary eccentric on the other side of said support plate driven by said gearing, a grip handle at the upper end of the support plate having extensions extending laterally in opposite directions from the support plate and parallel to the axis of the crank for manual support and movement of the device, a body having its upper end encompassing said eccentric to provide orbital movement, said body having parallel guide surfaces extending longitudinally, a hollow needle fixed to the lower end of the body, a stationary guide ring on said support plate slidably guiding said hollow needle, a crank arm adjacent said rotary eccentric driven by said gearing, a slide block guided for longitudinal movement between said parallel guide surfaces on said body, a solid inner needle fixed to said slide block and extending through said hollow needle, the hollow needle having a yarn-receiving window near its lower end, and a link connecting said crank arm to said slide block, whereby said inner needle may be caused to reciprocate from a position above said window to a position below the lower end of hollow needle.

4,006,695

APPARATUS FOR APPLYING SLIDE FASTENER CHAIN TO TUBULAR GARMENT

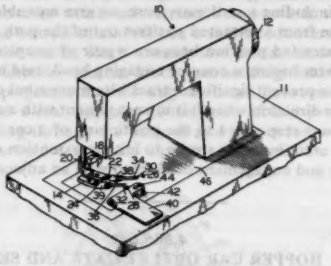
William Frederick Van Amburg, Meadville, Pa., assignor to Textron, Inc., R.I.

Filed May 30, 1975, Ser. No. 582,161
Int. Cl.² D05B *3/12*
U.S. Cl. 112—104 **2 Claims**

1. An apparatus for sewing a pair of stringers of a slide fastener chain to opposite edge portions of a seam opening in a tubular garment, the apparatus comprising

a sewing machine having a tabletop, two stitching means, each including a needle, and means for feeding the pair of stringers together with the respective opposite edge portions of the seam opening in the garment simultaneously and in parallel through the respective stitching means, and

a plate mounted in a raised horizontal position above and spaced from the tabletop in front of the two stitching means and the feeding means for engaging the portion of



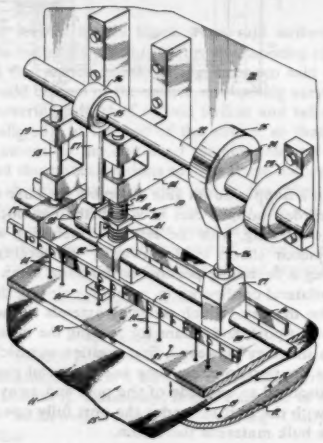
the tubular garment opposite the seam opening to prevent the engaged portion of the garment from being fed through the stitching means.

4,006,696

FLOATING PRESSER FOOT FOR QUILTING MACHINE

Joe E. Robertson, Santa Ana, Calif., assignor to Kirsch Company, Sturgis, Mich.

Filed Jan. 12, 1976, Ser. No. 648,003
Int. Cl.² D05B *11/00*
U.S. Cl. 112—117 **13 Claims**



1. In a quilting machine of the type including a bed plate, means for conducting material to be quilted over said bed plate, vertically reciprocal needles positioned above said bed plate for moving sewing threads through said material to form stitches therein, presser foot means positioned above said bed plate, means for supporting said presser foot means for vertical reciprocation relative to said bed plate between upper and lower positions for periodically compressing and releasing said material, and means for driving said presser foot means, the improvement wherein said presser foot means driving means comprises:

means including a pair of opposed, balanced springs for biasing said presser foot means in a position intermediate said upper and lower positions; and

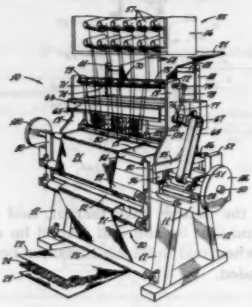
means for cyclically, alternately, increasing and decreasing the compression of one of said springs and simultaneously decreasing and increasing the compression of the other of said springs to reciprocate said presser foot means between said upper and lower positions.

4,006,697

HIGH SPEED QUILTING MACHINE

Joe E. Robertson, Santa Ana, Calif., assignor to Kirsch Company, Sturgis, Mich.

Filed Jan. 12, 1976, Ser. No. 648,002
Int. Cl.² D05B 11/00
U.S. Cl. 112—118 28 Claims



1. In a quilting machine of the type including a bed plate, material supporting means including material feeding means for conducting material to be quilted over said bed plate, sewing thread supply means, vertically reciprocal needles positioned above said bed plate for moving sewing threads through said material and said bed plate, horizontally reciprocal shuttles mounted beneath said bed plate and cooperating with said vertically reciprocal needles for forming lock stitches in said material, vertically reciprocal presser means positioned above said bed plate for holding said material on said bed plate during formation of said stitches, thread take-up means positioned between said thread supply means and said needles for controlling the tension in said threads during said formation of said stitches, and pattern controlling means for moving said material supporting means laterally in a preselected relationship with said material feeding means for obtaining sewing patterns, the improvement comprising:

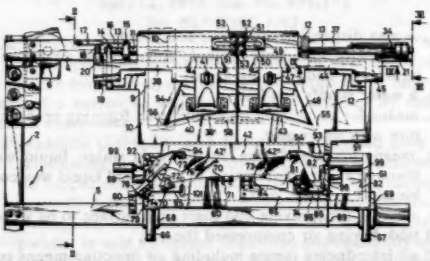
means for driving said needles continuously between upper and lower positions, with no delay or dwell time at the ends of the strokes of said needles and with no hump or other irregularities in the movement thereof.

4,006,698

SEWING DEVICE FOR PERFORMING SEAMS ON SIMILAR WORKPIECES OF DIFFERENT LENGTH

Hans Scholl, Oerlinghausen-Lipperreihe; Wolfgang Sugland, Herford, and Jochen Fischer, Brackwede, all of Germany, assignors to Kochs Adler AG, Bielefeld, Germany

Filed Jan. 17, 1975, Ser. No. 541,784
Int. Cl.² D05B 19/00, 3/00
U.S. Cl. 112—121.11 4 Claims



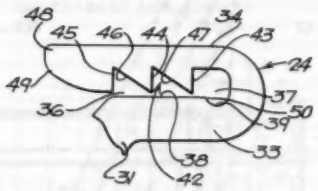
1. A sewing device with guided control of a sewing cycle, comprising, in combination a support means, a sewing machine having a reciprocating needle, movable carrier means for said sewing machine, an adjustable master cam consisting of two halves having a peripheral edge and a bridging rail overlapping said two halves, for forming a continuous cam edge for said master cam, a driven roller secured to said movable carrier means for said sewing machine and engaged with said peripheral edge of said master cam and coaxial with said needle, a bipartite workpiece clamping means having left lower and upper clamping plates, right lower and upper clamping plates, and lifting means for said left and right upper clamping plates, a stationary carrier body for receiving one of said two master cam halves and said left lower and upper clamping plates, a slidable carrier body for receiving the second half of said two master cam halves and said right lower and upper clamping plates, and provided with stop means, a rod secured to said support means for slidably receiving said slidable carrier body, a limit stop carrier pivoted on said rod, a plurality of adjustable limit stops of different lengths circularly attached to said limit stop carrier and cooperating with said stop means of said slidable carrier body, and means for intermittently revolving said limit stop carrier about said rod.

4,006,699

THREAD GUIDE MEANS FOR SEWING MACHINE

Kimikazu Matsuda, Hirakata, Japan, assignor to Maruzen Sewing Machine Co., Ltd., Moriguchi, Japan

Filed Nov. 19, 1975, Ser. No. 633,587
Claims priority, application Japan, June 13, 1975, 50-73395; Apr. 26, 1975, 50-52983
Int. Cl.² D05B 49/00
U.S. Cl. 112—241 6 Claims



1. In a sewing machine, a take-up lever having a thread guide including a first arm portion and a reversely directed second arm portion overlying the first arm portion in spaced relation and providing an elongated slot therebetween, said slot being open at one end and communicating with an aperture spaced from said open end for accommodating the thread during the sewing operation, the edge of said first arm portion defining the lower boundary of said slot being substantially a straight line, said second arm portion including a detent constituting a depending straight edge extending in angular relation to said boundary edge with the lower end of said straight edge being disposed in confronting spaced relation to said boundary edge, said detent being spaced from said aperture in the direction of said open end and being adapted normally to prevent a thread from moving outside of said slot during the operation of said take-up lever.

4,006,700

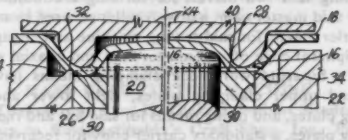
METHOD FOR MAKING CONTAINER CLOSURES

Walter Carl Lovell, Wilbraham, and Frederick Gerard Joseph Grise, Osterville, both of Mass., assignors to USM Corporation, Boston, Mass.

Filed May 5, 1975, Ser. No. 574,643
Int. Cl.² B21D 51/40
U.S. Cl. 113—121 C 6 Claims

1. The method of making a digitally disruptable line in sheet metal having opposite generally planar surfaces which method

consists in substantially simultaneously bending a portion of the metal to form a wall with a locality bowed in tension adjacent to one surface thereof, and longitudinally coining



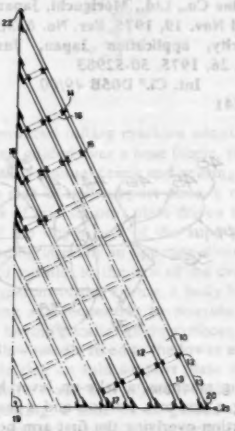
said tensioned surface and locality of the wall as it is being thus bent to create in the residuum thickness adjacent to the opposite surface of said wall locality a fractured but integral section defining said line.

4,006,701

SEGMENTAL SAIL FOR BOATS

Glauco Corbellini, Via Carducci, 33100 Udine, Italy

Filed Mar. 10, 1975, Ser. No. 556,803
Claims priority, application Italy, Mar. 8, 1974, 83319/74
Int. Cl.² B63H *9/04*
U.S. Cl. 114—102 17 Claims



1. A sectional sail for boats including in reciprocal combination and cooperation a plurality of sections parallel to one side of the sail, each of said sections being provided with a luff-rope and a leech-rope at the fore and aft vertical edges of said sections, and means for tensioning and tightening said ropes; stiffening battens arranged on said sections betwen said luff- and leech-ropes and extending substantially from edge to edge of said sections for maintaining a constant distance between the edges for entry and exit of the wind between said sections; means for securing the ends of said sections, and means for connecting the edges of said sections, said ends of said sections being substantially aligned and axially successive.

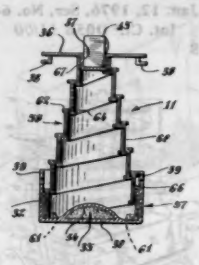
4,006,702

ROAD BUOY

Napoleon St. Cyr, 10 Overland Drive, Stratford, Conn. 06497

Filed Aug. 28, 1975, Ser. No. 608,579
Int. Cl.² E01F *9/10*
U.S. Cl. 116—63 P 4 Claims

1. A road buoy comprising a weighted base and a marker portion detachably secured thereto, said marker portion expandable to an operational height and collapsible with respect to said weighted base to reduce said road buoy to a compact size for storage and transportation thereof, wherein said collapsible marker portion is comprised of a continuous strip of resilient, semi-rigid material, said strip having a first inwardly disposed lip on the top edge thereof and a second outwardly



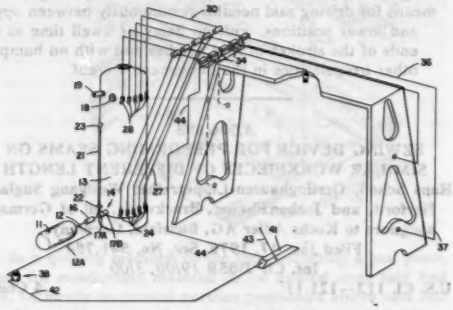
disposed lip on the bottom edge thereof, said strip spirally coiled so that said first lip and said second lip of successive coils interlock when said collapsible marker portion is telescopically expanded.

4,006,703

FOAMED WAX APPARATUS

Judson L. Smith, 5432 Lighthouse Lane, Tempe, Ariz. 85283

Division of Ser. No. 432,815, Jan. 14, 1974, abandoned. This application Nov. 10, 1975, Ser. No. 630,654
Int. Cl.² B05C *13/00*; B05B *13/00*
U.S. Cl. 118—2 8 Claims



1. A wax dispensing apparatus comprising:
a. a tank which is adapted to hold and dispense a mixture of liquid wax and foaming agent,
b. a water supply conduit,
c. means for combining said liquid wax-foaming agent mixture with said water,
d. means for introducing air into said water, liquid wax-foaming agent combination to cause said liquid wax combination to foam, and
e. a means for spraying said foam on a surface to be waxed, said tank having air compressed therein,
said air introducing means including air injecting means connected to said tank below the level of said liquid wax-foaming agent combination therein.

4,006,704

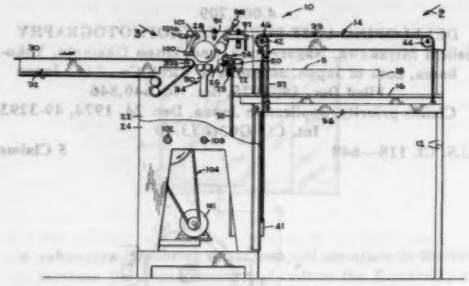
STRAIGHT LINE GLUER

Giorgio Perondi, Milanino, Italy, assignor to FMC Corporation, San Jose, Calif.

Continuation-in-part of Ser. No. 497,008, Aug. 13, 1974, abandoned. This application Apr. 10, 1975, Ser. No. 567,042

Int. Cl.² B05C *1/02*

U.S. Cl. 118—50 6 Claims



1. In a gluing machine of the type including a frame, a magazine for supporting an upright stack of sheets, a vacuum head for removing the uppermost sheet from the magazine at a pickup position and feeding it from the stack to a sheet delivery position, feed rolls for gripping and transporting the fed sheet, a glue roll in rolling contact with said sheet for depositing a film of adhesive thereon, a sheet support device beneath said glue roll and a conveyor for transporting the coated sheet to a downstream station; the improvement comprising laterally spaced upright lever means, means for pivotally mounting one end of said lever means for coaxial swinging movement of the other end substantially along the path of the sheet between a rearward sheet pickup position over the magazine and a forward sheet delivery position; means for swinging said lever means about said pivot means between advanced and retracted position, a rock shaft mounted in said frame, crank means on said rock shaft connected to the associated pivot means of said lever means for raising and lowering said lever means by oscillation of said rock shaft and independently of the swinging movement of said lever means, continuously operating power means for oscillating said rock shaft, shaft means for mounting said vacuum head rotatably mounted on the other ends of said lever means, said shaft means having laterally spaced arms mounting an offset vacuum tube that carries said vacuum head, and means for independently turning said shaft means to control the position of said head.

4,006,705

LIMITED PRESSURE APPLICATOR

Tipton L. Golins, and David Mayes, both of Beaumont, Tex., assignors to Helena Laboratories Corporation, Beaumont, Tex.

Division of Ser. No. 620,736, Oct. 8, 1975. This application Apr. 12, 1976, Ser. No. 676,171

Int. Cl.² B05C *1/02*

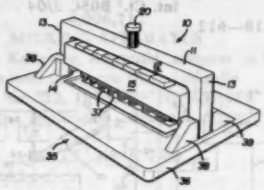
U.S. Cl. 118—221 4 Claims

1. In an apparatus for transferring uniform samples of blood or the like from a reservoir to a sample support, the improvement of a carrier to which the sample adheres by surface tension comprising:

a generally U-shaped yoke having an elongated base and terminating in a pair of opposed legs which are adapted to be supported on a platform, each of said legs having an inwardly facing opposed longitudinal groove therein;

an elongated slide bar slidably mounted in said grooves parallel to said elongated yoke base and resiliently urged toward the yoke base, said slide bar having an elongated slot extending therethrough; and

an applicator element freely suspended from said bar and through said slot and extending below the bottom of said guide bar away from the yoke base so that upon sliding said guide bar in said groove against said resilient urging, said applicator element then extends outwardly beyond



the legs of the yoke and is adapted to contact, solely under the influence of gravity, either a sample in a reservoir or an absorbent sample support, whichever is supported on the platform.

4,006,706

DEVICE FOR APPLYING GLUE TO CHIPS

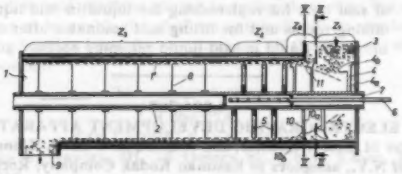
Wilhelm Lödige, Elsener Str. 9c; Fritz Lödige, Leuschnerstr. 12, and Josef Lücke, Im Lohfeld 13, all of 4790 Paderborn, Germany

Filed June 16, 1975, Ser. No. 587,318

Claims priority, application Germany, June 14, 1974, 2428588

Int. Cl.² B05C *5/00*; 259 *9/10*

U.S. Cl. 118—303 22 Claims



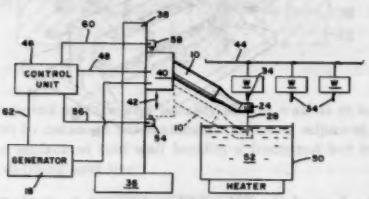
1. An apparatus for applying glue to chips, fibers, and similar parts of cellulose containing substances such as wood and bagasse, which includes: an at least approximately cylindrical chamber comprising an inlet chute at one of its ends and an outlet at its other end and when viewing from said inlet chute toward said outlet also comprising successively an inlet zone and a ring forming zone and a gluing zone, and a post-mixing zone, a rotatable shaft longitudinally extending within said chamber from said inlet zone to said other chamber end, conveyor tool means arranged within said inlet zone and keyed to said shaft for rotation therewith, said ring forming zone being formed by the transition between said inlet zone and said gluing zone, a plurality of glue applying tools arranged within said gluing zone and connected to said shaft for rotation therewith while extending from said shaft in the direction toward the inner peripheral surface of said chamber, loosening-up and drawing-in tools connected to said shaft for rotation therewith and arranged in said ring forming zone while extending from said shaft toward the inner periphery of said chamber, and post-mixing tools connected to said shaft in axially spaced relationship to each other within said post-mixing zone, the latter extending from said gluing zone to said other end of said chamber, the working surface of said loosening-up and drawing-in tools in said ring forming zone having a tapering decreasing working surface ending in a tip, the tip of said working surface forming the radially farthest outward portion of said working surface.

4,006,707

ULTRASONIC COATING APPARATUS

Clark A. Denslow, Wilton, Conn., assignor to Branson Ultrasonics Corporation, New Canaan, Conn.

Filed May 10, 1976, Ser. No. 684,472
Int. Cl.² B05C *3/04*
U.S. Cl. 118—612 **3 Claims**



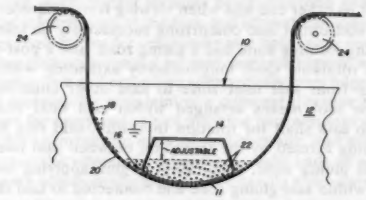
1. An ultrasonic processing apparatus comprising:
a support;
a tank adapted for holding a liquid;
an elongated resonator dimensioned to be resonant along its longitudinal axis at a predetermined high frequency of vibration having two ends;
electroacoustic converter means coupled to said resonator at one end thereof for imparting vibrations of said predetermined frequency to said resonator and causing said resonator when resonant to exhibit at least two antinodal regions and one nodal region of longitudinal vibration;
said resonator including a liquid retaining recess formed therein at said other end substantially at an antinodal region of longitudinal vibration, and
motive means coupled to said electracoustic converter means and said elongated resonator for periodically moving said resonator along said support for causing said liquid retaining recess to become submerged in the liquid of said tank for replenishing the liquid in said liquid retaining recess and for lifting said resonator after replenishing the liquid in said liquid retaining recess.

4,006,708

ELECTROGRAPHIC DEVELOPMENT APPARATUS

Peter M. Stacy, Webster, and Richard A. Weitzel, Hilton, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 1, 1975, Ser. No. 573,658
Int. Cl.² G03G *13/08*
U.S. Cl. 118—650 **6 Claims**



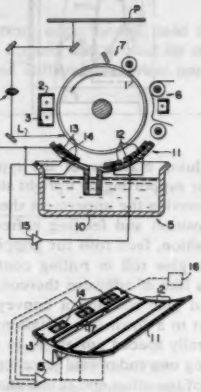
4. Electrographic apparatus for applying a single component, dry, electrically conductive developer material to an elongated recording element bearing a latent electrostatic image pattern on one surface thereof, said apparatus comprising:
means defining a recording element feed path, at least a portion of said path being of U-shape;
a transport mechanism for advancing the recording element along said feed path with the image-bearing surface of the recording element facing upwardly so that the recording element forms a self-contained, open-topped, developer reservoir for the developer material; and
an electrically conductive, grounded, apertured member positioned in the developer reservoir in close proximity to the image-bearing surface of the recording element so as to provide a tumbling action to the developer material and an electrically conductive path which rapidly dissipates any electrical charges generated on the developer material.

4,006,709

DEVELOPING UNIT FOR ELECTROPHOTOGRAPHY

Seiichi Miyakawa, Nagareyama, and Toyoo Okamoto, Yokohama, both of Japan, assignors to Ricoh Co., Ltd., Japan

Filed Dec. 15, 1975, Ser. No. 640,846
Claims priority, application Japan, Dec. 24, 1974, 49-3293
Int. Cl.² G03G *13/10*
U.S. Cl. 118—648 **5 Claims**



1. In a developing unit for electrophotography comprising,
a. means, having a surface movable in a predetermined direction past a developing station, for forming an electrostatic latent image on said surface,
b. developing electrode means disposed at said station in opposite relationship with said surface,
c. a plurality of detection electrodes each disposed in opposite relationship with said surface upstream of and adjacent said developing electrode means for sensing respective instantaneous potentials of portions of the electrostatic latent image on said surface opposing thereto so as to produce respective output signals,
d. means responsive to said signals for applying a potential slightly higher than the lowermost one of said sensed potentials to said developing electrode means, and
e. means for supplying a developing agent between said surface and developing electrode means, the improvement comprising,
f. protective electrode means disposed close to said detection electrodes in opposite relationship with said surface, and
g. means for applying a potential near those on said detection electrodes to said protective electrode means.

4,006,710

ARTISTIC BED FOR AQUARIUMS AND THE LIKE

Katherine A. Van Berkum, 25 Emerald Lane, Omro, Wis. 54963

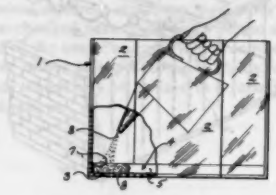
Filed July 25, 1975, Ser. No. 599,168
Int. Cl.² A01K *64/00*
U.S. Cl. 119—5 **3 Claims**

1. The method of forming an artistic bed in an aquarium, comprising the steps of:
a. providing a thin-walled form having a peripheral edge

wall and a plurality of interior walls forming separate chambers open at the top and bottom,

b. placing said form on the bottom of an empty aquarium,

c. pouring flowable materials of different types and/or colors into each chamber until the material fills the chamber to slightly below the top edge of said form to create the bed design with the portions of the latter maintained separate,



d. subsequently pouring water into said aquarium to thereby increase the cohesiveness and reduce the flowability of said materials by water saturation,

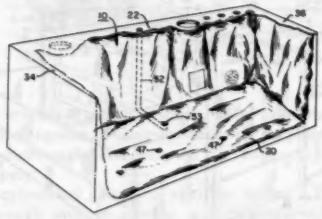
e. and subsequently removing said form upwardly from the saturated bed and through the water so that the design remains intact.

4,006,711

UNITARY LINER FOR AN AQUARIUM

Michael G. Frank, 204 Weeping Willow Lane, Fairfield, Conn. 06430

Filed July 28, 1975, Ser. No. 599,680
Int. Cl.² A01K *64/00*
U.S. Cl. 119—5 **19 Claims**



1. An aquarium liner for insertion in an aquarium so as to conceal aquarium accessories while providing for their unhampered operation and eliminating the need for sand and gravel comprising:

A. a bottom member dimensioned for insertion in an aquarium over substantially the entire inner bottom surface of the aquarium, said bottom member having an upper surface and a first aeration conduit passageway having an aperture passing through the upper surface of the member; and

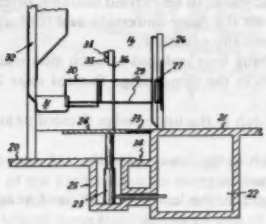
B. a diorama backdrop member dimensioned for receipt within the aquarium so as to cover substantially the entire inner rear surface of the aquarium, having a lower region dimensioned for integral combination with the rearward region of the bottom member, an upper surface extending near and substantially parallel to the rearward, upper termination of the aquarium, and an outer surface facing toward the inner, front surface of the aquarium, said backdrop member having, at least one recess formed therein behind the outer surface and extending through its upper surface for receipt of aquarium accessories, a porous region passing through the outer surface of the diorama backdrop and communicating with at least one of said recesses for circulation of water therethrough, and a second aeration conduit passageway communicable with the first aeration conduit passageway so as to provide oxygen to the aquarium water.

4,006,712

MILKING APPARATUS

John Forth Peel, Kellyville, Australia, assignor to Nealeforth Farms Pty. Limited, Canberra City, Australia

Filed Nov. 12, 1975, Ser. No. 631,089
Claims priority, application Australia, Nov. 18, 1974, 9656/74
Int. Cl.² A01K *1/00*
U.S. Cl. 119—14.03 **7 Claims**



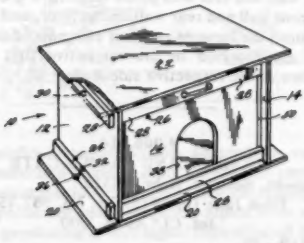
1. Milking apparatus comprising a plurality of milking stations located between a cow entry area and a cow exit area, the entry area being elevated relatively to the exit area, each milking station comprising a vertically moveable cow supporting platform capable of movement between a milking position substantially at the level of said entry area and an exit position substantially at the level of said exit area, said platform being hydraulically operated with sufficient lifting pressure being applied to said platform during lowering thereof to the exit position as to enable the platform automatically to rise to its milking position upon the cow stepping off the platform at its exit position.

4,006,713

COLLAPSIBLE DOG HOUSE

Charles B. Hawley, III, 10 Quincy St., Chevy Chase, Md. 20015

Filed Dec. 23, 1975, Ser. No. 643,643
Int. Cl.² A01K *1/02*
U.S. Cl. 119—19 **9 Claims**



1. A collapsible dog house, comprising:

six separable panel members including a floor, a roof, two opposite side walls and a front wall and a rear wall, each being generally rectangular;

means defining a dog entrance opening through the front wall;

a depending skirt on the underside of the roof, including a forward element, a rear element and two opposite side elements;

an upstanding skirt on the upper side of the floor, including four elements corresponding to those of the roof skirt, and being correspondingly placed, so that the two skirts may be placed in confronting engagement;

cooperative retaining and securement means on the roof and on the floor, which are engaged when the two skirts are in confronting engagement for maintaining the confrontation against axial and lateral disengagement;

distance between the roof underside and floor upper side when the two skirts are in confronting engagement being sufficient to permit the two opposite side walls, the front wall and the rear wall to be enclosed therebetween in a stack, surrounded by the skirts;

handle means provided on at least one of the floor and roof members, sited to permit the dog house, when the two skirts are maintained in confronting engagement and house said stack, to be carried thereby, brief case fashion, that is, with the floor underside and roof upper side generally vertically oriented;

means defining four notches in each side wall, including:

a first notch in the upper edge thereof near the front edge thereof;

a second notch in the upper edge thereof near the rear edge thereof;

a third notch in the lower edge thereof near the front edge thereof; and

a fourth notch in the lower edge thereof near the rear edge thereof;

the notches being respectively shaped and positioned to receive:

the forward element of the depending skirt;

the rear element of the depending skirt;

the forward element of the upstanding skirt; and

the rear element of the upstanding skirt, when the side walls are erected between the roof and the floor;

means defining two generally vertically extending channel on the inner side of each side wall, including:

one disposed to the rear of the first and third notches on the same side wall; and

the other disposed to the fore of the second and fourth notches on the same side wall;

the one grooves of the two side walls being respectively shaped and positioned to receive the opposite vertical edge margins of the front wall when the side walls and front wall are erected on the floor;

the other grooves of the two side walls being respectively shaped and positioned to receive the opposite vertical edge margins of the rear wall when the side walls and rear wall are erected on the floor, whereby:

the dog house may be erected by erecting the side walls on the floor, inserting the respective edge margins of the front wall and rear wall in the respective grooves to erect the front wall and rear wall on the floor, and lowering the roof until the forward and rear elements of the depending skirt are received in the respective first and second notches of the respective side walls.

4,006,714

TRAINER AND CROWD GATE

Louis Goossen, Beatrice, Nebr. 68310

Filed June 16, 1975, Ser. No. 587,155

Int. Cl.² A01K *3/00*

U.S. Cl. 119—20 **10 Claims**

1. A crowd gate for urging animals to move through a passage from an entry at one end to an exit at the opposite end, comprising:

an overhead track extending along said passage;

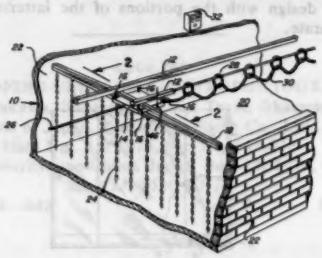
a carriage movable on said track;

means for moving said carriage on the track along the passage between the entry and exit;

a cross arm mounted on said carriage and extending across said passage;

a plurality of elongate electrical conductors suspended from spaced points on said cross arm and hanging downwardly therefrom forming a barrier across the passage; and

means for selectively connecting said conductors with a source of electrical energy, whereby said conductors may be connected with said electrical source during move-



ment of the carriage along the passage from the entry to the exit encouraging the animals to move ahead of the barrier toward the exit and said conductors may be disconnected from the electrical source when the barrier is positioned adjacent said entry, allowing animals to move through the barrier into the passage.

4,006,715

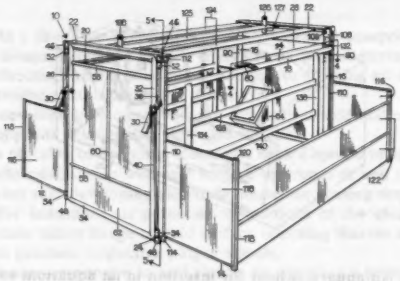
FARROWING CRATE ASSEMBLY

Jackson T. Redmon, Billings; Irvin Haidle, Fallon; Donald Herzog, Rapelje, all of Mont., and Joel C. Greene, Greer, S.C., assignors to Agribest, Inc., Billings, Mont.

Filed Dec. 5, 1975, Ser. No. 638,149

Int. Cl.² A01K *1/02*

U.S. Cl. 119—20 **13 Claims**



1. A farrowing crate assembly for a sow and her piglets and the like including a farrowing crate and a pair of associated side pens connected on each side of said farrowing crate, said farrowing crate comprising:

a plurality of spaced vertical standards;

a pair of interchangeable opposed side members slideably received over said spaced vertical standards spacing said vertical standards longitudinally, said side members being interchangeable on said standards;

an upper and lower bridger flange carried between the top and bottom, respectively, of said vertical standards so as to space said vertical standards and said opposed side members apart laterally;

a pair of interchangeable door members carried by said bridger flanges;

attachment means carried adjacent each side of said door members providing a pivotal attachment at each upper and lower bridger flange so that said door members can be selectively opened from either side;

said interchangeable side members each having offset side

frame portions so as to vary the width of the crate interior between said opposed side members when carried by said standards in said interchangeable manner so as to be selectively offset inwardly or outwardly; and

locking means carried by said interchangeable side members cooperating with said vertical standards to lock said side members in a desired height position along the vertical length of said standards;

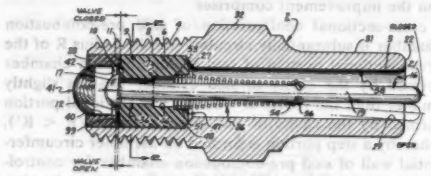
whereby said interchangeable side members may be interchanged varying the width of the crate interior to accommodate different size sows, said door members may be interchanged permitting entry of the sow through either end of the crate, and said door members may be opened from either side providing a highly versatile farrowing crate which may be utilized in a variety of configurations and spaces.

4,006,716

MINIATURE ANIMAL-WATERING VALVE

David L. Cross, Napa, Calif., assignor to Atco Manufacturing Co., Inc., Napa, Calif.

Filed Dec. 1, 1975, Ser. No. 636,700
Int. Cl.² A01K 7/00
U.S. Cl. 119—72.5 **3 Claims**



1. A miniature animal-watering valve comprising:

a. an elongated housing formed with a cylindrical passage therethrough; and adapted for connection to a water supply;

b. a cylindrical valve seal member having a passage therethrough and an outside wall dimensioned to sealably engage the inner wall of said housing passage, and the upstream end of said seal member is formed with an inwardly sloping conical surface;

c. a valve lever member having a valve head member formed with an annular small radius outer edge positioned for "line-point" contact with said sloping conical surface of said valve seal member and said valve lever member also having a lever arm extending from said head axially through said housing passage and spaced from said inside wall and extending slightly beyond the distal end of said housing;

d. biasing means mounted in said housing and engaging said lever arm for centering said valve lever member;

e. means holding said valve seal member in a fixed position within said housing;

f. said means holding said valve seal member consists of a plurality of annular indents formed in said housing protruding into said cylindrical passage;

g. one of said annular indents is formed immediately downstream of the lower edge of said valve seal member and is in contact with said member; and

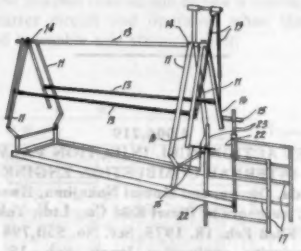
h. said valve seal member is formed with a downstream portion having a gradually increasing outside diameter for positively engaging said downstream indent.

4,006,717

CONTROL MECHANISM FOR A DRAFTING RACE

Walter John Hicks, Post Office, Pingrup, Western Australia, Australia (6343)

Filed Aug. 25, 1975, Ser. No. 607,532
Claims priority, application Australia, Aug. 23, 1974, 8639/74
Int. Cl.² A01K 29/00
U.S. Cl. 119—155 **6 Claims**



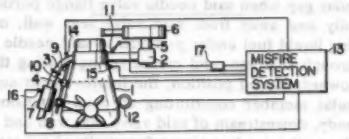
1. A control mechanism, for operating a drafting gate of a drafting race of the kind having an elongated structure defining a passage for animals and a drafting gate pivotably mounted for lateral movement across an end of said structure such that an animal emerging from said passage passes to one side or the other of said gate, said control mechanism comprising a superstructure adapted to be mounted above said race structure, an elongated operating handle disposed along and adjacent to said race structure at a position such that it can be gripped by an operator standing at one side of the race structure, said handle being suspended from said superstructure and pivoted thereto for rocking movement about a substantially horizontal axis, and means for coupling said operating handle to said drafting gate to permit pivoting of said gate.

4,006,718

MISFIRE DETECTION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Toshiaki Konomi, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed May 20, 1974, Ser. No. 471,558
Claims priority, application Japan, May 31, 1973, 48-60312
Int. Cl.² F02M 51/00
U.S. Cl. 123—32 EA **5 Claims**



1. In a misfire detection system adapted for use with an internal combustion engine having an exhaust portion and a fluid adjustment portion, comprising first generating means in an exhaust portion of an engine, and coupled to an adjustment portion for generating a first signal indicative of the oxygen concentration of exhaust gas from an engine to adjust the supply of a first fluid to an engine, and second generating means responsive when the first signal remains above a given value at the conclusion of a prescribed duration of such fluid supply adjustment for generating a second signal indicative of an engine misfire, means responsive to the first signal and operative at a sampling rate for generating a first binary value whenever the first signal is above the given value and a second binary value whenever such first signal is below the given value; a reversible counter; means for incrementing the

counter in one of two opposite directions upon each occurrence of the first and second binary values, respectively, means rendered effective when the counter has been incremented to the limiting value associated with a prescribed direction for thereafter separately accumulating subsequent occurrences of the corresponding binary value; and means rendered effective when a predetermined number of such subsequent additional occurrences of the corresponding binary value has been accumulated for producing the second signal.

4,006,719

VORTEX ACTION FUEL INJECTION VALVE FOR INTERNAL COMBUSTION ENGINE

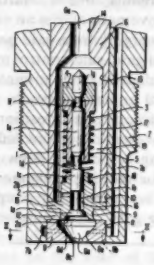
Fumio Kanda, Ogawa, and Kousei Nakajima, Hanazono, both of Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Feb. 18, 1975, Ser. No. 550,798

Claims priority, application Japan, Feb. 19, 1974, 49-19338[U]

Int. Cl.² F02B *3/00*

U.S. Cl. 123—32 JV **4 Claims**



1. In a fuel injection valve for an internal combustion engine which includes a valve body terminating at one end in an annular, diverging valve seat wall in a direction, axially outward of said body, a needle valve slidably mounted within the valve body and terminating in an enlarged radial flange portion having an outwardly diverging surface which mates with the diverging annular valve seat wall and forms therebetween an annular gap when said needle valve flange portion moves outwardly and away from said valve seat wall, means for supplying liquid fuel under pressure to said needle valve for flow through said gap, and means spring biasing the needle valve towards closed position, the improvement comprising: an annular member constituting an axial extension of said valve body, downstream of said valve seat wall and including a circular wall extending circumferentially about said annular valve seat and radially outwardly therefrom and forming an air vortex chamber such that fuel injection through the gap formed between the diverging valve seat wall and said needle valve flange portion collides with the vortex chamber inner wall, said circular wall including a lower wall portion which converges axially away from said needle valve and a plurality of circumferentially spaced air passages within said annular member opening tangentially into the vortex chamber in said lower wall portion at a plane which coincides with the line of impact of the fuel injected through said gap onto the vortex chamber wall; whereby said plurality of air passages creates a uniform high speed vortex within said vortex chamber, and wherein fuel impingement in the plane of entry of said tangential air passages significantly decreases the velocity of the fuel and promotes improved atomization of the fuel within the vortex air stream.

4,006,720

DIVIDED CHAMBER TYPE DIESEL ENGINE

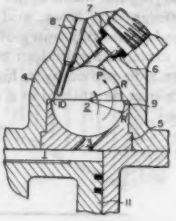
Takasi Sato, and Hirosi Yosizaki, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Apr. 21, 1975, Ser. No. 570,093

Claims priority, application Japan, Aug. 27, 1974, 49-102652[U]

Int. Cl.² F02B *19/00*

U.S. Cl. 123—32 C **3 Claims**



1. A divided chamber type of diesel engine including a block containing a cylinder; a cylinder head mounted on the block; a piston in the cylinder; a main combustion chamber defined between the piston and the cylinder head; a cavity formed in the cylinder head and opening into the main combustion chamber; and an insert member rigidly fitted into the opening of the cavity provided in said cylinder head, the insert member having a cavity facing the cavity in the cylinder head to define a pre-combustion chamber and a port connecting the pre-combustion chamber to the main combustion chamber, wherein the improvement comprises:

the cross-sectional configuration of said pre-combustion chamber is substantially circular, and the radius R of the cross-sectional portion of said pre-combustion chamber formed by the cavity in said cylinder head is slightly smaller than the radius R′ of the cross-sectional portion formed by the cavity in said insert member ($R < R'$), whereby a step portion is formed on the inner circumferential wall of said pre-combustion chamber for controlling the swirl generated in said pre-combustion chamber during the compression stroke of the diesel engine in order to reduce the NO_x emissions in the exhaust gases.

4,006,721

CONTROL APPARATUS FOR EXHAUST GAS RECIRCULATION SYSTEM

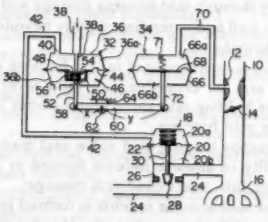
Yasuo Takagi; Kazuo Hioki, and Syunichi Aoyama, all of Yokohama, Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed May 30, 1975, Ser. No. 582,384

Claims priority, application Japan, June 24, 1974, 49-72081

Int. Cl.² F02M *25/00*

U.S. Cl. 123—119 A **10 Claims**



1. In an internal combustion engine having a carburetor provided with a venturi and an intake manifold, a control

apparatus for an exhaust gas recirculation control valve comprising a first flexible diaphragm responsive to a venturi vacuum in said carburetor, a second flexible diaphragm defining a vacuum chamber and responsive to vacuum output present therein, said second flexible diaphragm having a valve opening providing communication between said vacuum chamber and an atmosphere, a control valve cooperating with said second flexible diaphragm and opening and closing said valve opening, and a control arm connected between said first and second flexible diaphragms and rotatable about a fulcrum, said control arm transmitting movements of said first flexible diaphragm to said second flexible diaphragm, whereby said second flexible diaphragm is moved in response to the movements of said second flexible diaphragm and the vacuum output in said vacuum chamber for controlling said control valve to open and close said valve opening for thereby regulating the vacuum output in said vacuum chamber, and regulated vacuum output being fed to said exhaust gas recirculation control valve to actuate the same.

4,006,722

METHOD AND DEVICE FOR CLEANING GASES EXHAUSTED FROM MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

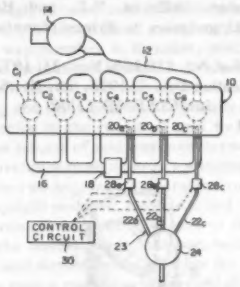
Yoshitaka Hata, Fujisawa; Kenji Ikeura, Yokohama, and Haruhiko Iizuka, Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jan. 31, 1975, Ser. No. 545,915

Claims priority, application Japan, May 16, 1974, 49-54112

Int. Cl.² F02M *23/04*

U.S. Cl. 123—124 A **9 Claims**



4. A multi-cylinder internal combustion engine having first and second groups of cylinders, comprising:

a carburetor supplying a first air-fuel mixture richer than stoichiometric air-fuel mixture into all the cylinders of the engine;

an intake manifold connecting said carburetor to all the cylinders of the engine;

supplemental air feed means feeding air into the second group of cylinders of the engine such that the second group of the cylinders receive a second air-fuel mixture leaner than the stoichiometric air-fuel mixture.

4,006,723

CONTROL SYSTEM FOR STARTING AND STOPPING AN INTERNAL COMBUSTION ENGINE

Paul Schmidli, Birmensdorferstrasse 240, Zurich, Switzerland

Continuation-in-part of Ser. No. 382,171, July 24, 1973, abandoned. This application Oct. 24, 1974, Ser. No. 517,653

Claims priority, application Switzerland, July 25, 1972, 11100/72; Oct. 6, 1972, 14699/72; Jan. 19, 1973, 737/73

Int. Cl.² F02N *17/00*

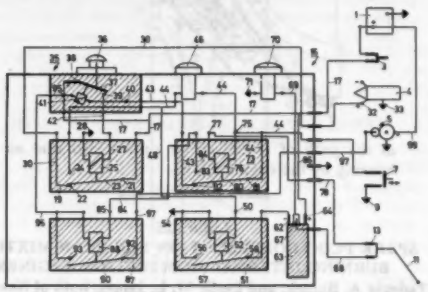
U.S. Cl. 123—179 B **14 Claims**

1. A control system for stopping and starting an internal combustion engine provided with an ignition circuit and a starter motor, comprising:

a starter circuit coupled to said starter motor for controlling operation of the starter motor to start the internal combustion engine;

first operator actuated switch means for interrupting the ignition circuit to stop the internal combustion engine and for rendering said starter circuit capable of operation upon actuation thereof;

second switch means connected to said starter circuit and responsive to the operating state of the internal combustion engine, said second switch means being inoperative when the internal combustion engine is running to disable said starter circuit and operative when the engine is stopped to enable said starter circuit;



third operator actuated switch means connected to said starter circuit for closing said starter circuit and actuating said first switch means to close the ignition circuit upon actuation thereof to operate the starter motor and start the internal combustion engine, said second switch means being rendered inoperative when the internal combustion engine is started to terminate operation of the starter motor; and

a time delay switch in said starter circuit rendered operative upon actuation of said first switch means to permit repetition of the starting operation during a predetermined time after actuation of said third switch means to close the ignition circuit.

4,006,724

ARRANGEMENT FOR MOUNTING ELECTRONIC CIRCUIT BOARDS ON AN ENGINE-AIR INTAKE STRUCTURE

Ivor W. Carter, Grosse Pointe Woods, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

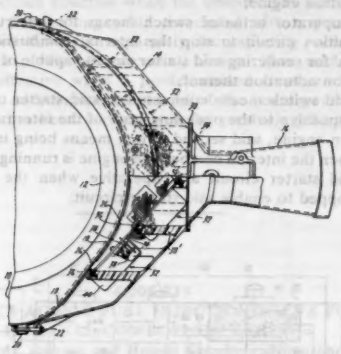
Continuation of Ser. No. 582,465, May 30, 1975, abandoned. This application Mar. 18, 1976, Ser. No. 668,026

Int. Cl.² F02B *77/00*

U.S. Cl. 123—198 E **18 Claims**

1. In an engine powered vehicle having an induction air intake system for the engine including an air filter housing and including electronic engine control circuitry, the improvement comprising: means mounting at least portions of said control circuitry on a circuit board, and

means mounting said circuit board on said air filter housing



in the path of induction air drawn into said air filter housing by the engine.

4,006,725

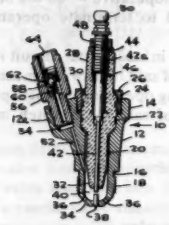
SPARK PLUG CONSTRUCTION FOR LEAN MIXTURE BURNING INTERNAL COMBUSTION ENGINES

Tadeusz A. Baczek, and Leslie M. L. James, both of New Bedford, Mass., assignors to Baczek and James Company, Inc., New Bedford, Mass.

Continuation-in-part of Ser. No. 558,921, March 17, 1975, abandoned. This application Mar. 12, 1976, Ser. No. 666,196

Int. Cl.² F02B *19/10, 19/18*

U.S. Cl. 123—32 SJ **11 Claims**



1. An internal combustion engine for minimizing unwanted emissions and achieving fuel economies by combustion of a lean fuel-air mixture to drive the pistons of the engine, a cylinder bore in the engine having a crank-connected piston movable therein and having walls coactively defining with the piston a main combustion chamber above the piston, means providing a first and second different fuel sources, the first fuel source providing a lean fuel-air mixture, a first fuel supply conduit connected to the first fuel source for supplying the lean fuel-air mixture to said main combustion chamber, a second fuel conduit connected to the second fuel source, a spark plug mounted in the engine communicating with the main combustion chamber having an elongated body supporting electrodes defining a spark gap at one end thereof, the spark plug including a metallic tubular dome defining a spark ignition chamber of limited volume surrounding and enclosing the spark gap and having exit ports for discharge of flame outwardly therethrough, screw thread formations on the spark plug body for screw mounting the spark plug in a conventional threaded spark plug opening in the engine at a position where the dome formation protrudes inwardly within the upper portion of the main combustion chamber, the spark plug body including a branch formation having a valved branch passage therethrough opening at its inner end into said spark ignition chamber within said dome and connected at its outer end to said second fuel conduit to supply fuel from the second fuel source to the spark ignition chamber for providing a rich fuel-air mixture therein to be ignited by a spark at the spark gap and produce flames discharging through said exit ports into the main combustion chamber to ignite the lean fuel-air mixture in the latter, valve means in said branch passage for introducing the second source fuel into the spark ignition chamber, the engine having valve means for introducing the lean fuel-air mixture through said first supply conduit directly into the main combustion chamber, said valve means in said branch passage comprising a valve seat and a valve member resiliently biased to normally closed position against said valve seat and responsive to reduced pressure communicated through said branch passage from said main combustion chamber during a suction stroke of the piston to open and admit the fuel from said second fuel source to the spark ignition chamber defined within said dome said elongated body of said spark plug housing an elongated center electrode rod extending along a rectilinear center axis throughout the length of the spark plug and terminating in an externally exposed terminal cap formation at the end of the center electrode opposite the spark gap, and said branch passage extending along a substantially rectilinear axis inclined at an acute angle to the axis of said center electrode diverging laterally therefrom progressively from the inner end of the branch passage to its outer end whereby the outer end of said branch passage defines a connection to be coupled to said second fuel conduit located laterally adjacent the terminal cap formation of said center electrode.

4,006,726

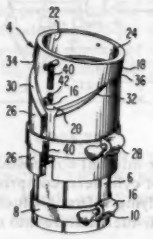
OSCILLATOR TYPE BALL DEFLECTOR

Gerard F. Sweeton, Skillman, N.J., and Howard Head, Baltimore, Md., assignors to Prince Manufacturing, Inc., Princeton, N.J.

Continuation of Ser. No. 418,100, Nov. 21, 1973, abandoned. This application Dec. 4, 1975, Ser. No. 637,618

Int. Cl.² F41D *11/00*

U.S. Cl. 124—81 **13 Claims**



1. For use with a ball projecting device, a ball directing means comprising a deflecting means adapted to be mounted on the device in a position to be engaged by successively discharged balls, said deflecting means being pivotally mounted and having a plurality of alternatively engageable positions, said deflecting means being responsive to engagement with successively discharged balls to assume one of the plurality of ball engaging positions, and a releasable holding means for holding said deflecting means in a predetermined position until engaged by a discharged ball.

4,006,727

ANGLE DRESSING TOOL

Seth E. Hancock, 3502 Carla Drive, Austin, Tex. 78754

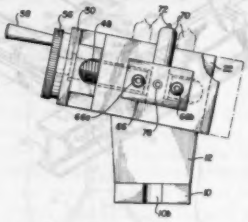
Filed Dec. 3, 1975, Ser. No. 637,288

Int. Cl.² B24B *53/04*

U.S. Cl. 125—11 AT **4 Claims**

1. An angle dressing tool for dressing angular surfaces of

rotating grinding wheels and the like comprising: a horizontal base plate; a planar-faced upright member mounted on said base plate and extending transversely thereacross; a dovetail way member and a dovetail slide member having complemental ways enabling the slide member to be translated in linear directions along the way of the way member; means mounting said dovetail way member flush against the rear planar face of the upright member and for releasably securing said way member in a selected angular position about a horizontal axis extending through a hole provided in said upright member, said means including a bushing having axial length greater than the thickness dimension of said upright member mounted in said hole, bolt and clamp-washer means for securing said bushing in said hole in an axial position such that its front-end face is flush with the front planar face of said upright member and that its opposite and projects beyond the rear face of said member and terminates in a recess provided for its reception



in a planar rear face provided on said way member and which is sized to snugly receive said projecting end, whereby said projecting end provides a short axial-length hub about which the dovetail way member is turnable, said bolt and clamp-washer means including a headed bolt whose threaded shank has length such that its end extends beyond the rear end face of the bushing and threads into an internally threaded opening provided therefor in the recess of said way member; means operable upon release of said way-member securing means for setting the dovetail way member in a selected angular position comprising pin-and-hole means operable from the front planar face of said upright member; means carried by said way member for imparting linear motion in one or the other opposite direction to the dovetail slide member, means affixed to the front face of said dovetail slide member for movement therewith, said last means mounting an upright shaft-form member provided at its upper end with a diamond dressing element.

4,006,728

ROOM HEATING APPARATUS USING COMBUSTION

Atsuyoshi Nishi; Shizuo Futaguchi; Akio Ishida, all of Nakatsugawa; Toshio Ito; Tamotsu Nomaguchi, both of Amagasaki; Toshihiko Makino, and Tatsuo Saito, both of Nakatsugawa, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 475,841, June 3, 1974, abandoned, which is a continuation of Ser. No. 225,805, Feb. 14, 1972, abandoned. This application May 29, 1975, Ser. No. 581,948

Claims priority, application Japan, Feb. 13, 1971, 46-7696; Mar. 24, 1971, 46-17102

Int. Cl.² F24H *3/10*

U.S. Cl. 126—110 R **11 Claims**

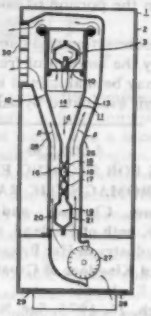
1. A room heating apparatus using combustion gas comprising:

a linear type burner having a comb-tooth shaped flame hole plate comprising a plurality of slits disposed between front and back burner outer walls, said slits being open from the bottom of said burner when in use and being used as flame holes, the depth of said flame holes being within the range of 3–15mm;

a combustion chamber having a substantially flat shape supporting said linear type burner in the upper part thereof and providing an inner space for conducting combustion for transmitting heat energy to the outside by heat exchange;

a first blower disposed adjacent to said combustion chamber for supplying combustion air to said linear type burner;

a heat exchanger having a substantially flat shape being disposed below said combustion chamber and having an inner space connected to the inner space of said combustion chamber for passing combustion gas from the inner



space of said combustion chamber to the inner space of said heat exchanger for transmitting heat energy to the outside of the heat exchanger;

an exhaust duct disposed below said heat exchanger for exhausting combustion gas from the inner space of said heat exchanger to the outdoors; and

a second blower independently operable of said first blower disposed below said heat exchanger for recycling air into the room by passing air over the outer surfaces of said heat exchanger and said combustion chamber.

4,006,729

FIREPLACE

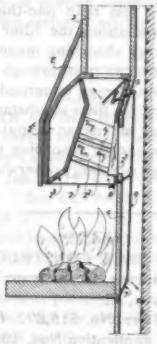
Valentin Cesa, 37 rue Eugene Meyzonnier, Annonay (Ardeche), France (07100)

Filed Mar. 4, 1975, Ser. No. 555,188

Claims priority, application France, Mar. 12, 1974, 74.09358

Int. Cl.² F24B *1/18*

U.S. Cl. 126—121 **3 Claims**



2. A fireplace for the heating of fresh exterior air and the recirculation of room air comprising:

a. a chimney hood casing having a plurality of first openings communicating with said room;

b. A chimney hood within the chimney hood casing having

second openings in registration with said first openings communicating with the interior of said casing;

c. a first chamber for receiving fresh air and a second chamber within said hood;

d. heating tubes within a portion of said hood joining said first and second chambers for the flow of fresh air therebetween, said heating tubes being generally rectangular in cross section;

e. a shaft for supplying fresh air to said first chamber and a chimney pipe for evacuating said portion of said hood;

f. a first damper located in said shaft and a second damper located between the portion of said hood and the chimney pipe; and

g. means for interconnecting said dampers for simultaneous control whereby the amount of fresh air supplied to said first chamber may be maintained in direct proportion to the amount of air evacuated by said chimney pipe.

4,006,730

APPARATUS FOR STORING ENERGY FROM ELECTROMAGNETIC RADIATION

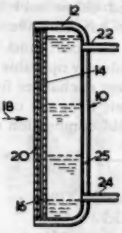
Peter Brian Clapham, Chertsey, and Michael Christopher Hutley, Hanworth, both of England, assignors to The Secretary of State for Industry in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Feb. 26, 1975, Ser. No. 553,407

Claims priority, application United Kingdom, Feb. 28, 1974, 9235/74

Int. Cl.² F24J *3/02*

U.S. Cl. 126—271 **7 Claims**



1. Apparatus, for storing energy from incident electromagnetic radiation, having a radiation energy absorbing means; an optical reflection filter which has a regular array of protuberances, the spacing of said protuberances being less than the smallest wavelength of visible radiation and the height of said protuberances being no less than one-third of the longest wavelength of visible radiation, the filter being positioned relative to the said energy absorbing means so that incident electromagnetic radiation can pass through the filter to reach the absorbing means, but energy reemitted by the absorbing means in the direction of the filter is substantially returned by the filter to the absorbing means; an output channel for drawing off energy from the energy absorbing means; and means for restricting the outflow of energy otherwise from the energy absorbing means.

4,006,731

BUILDING DECK CONSTRUCTION

Frank E. Carroll, Barrington, Ill., assignor to Decks, Incorporated, Rolling Meadows, Ill.

Continuation-in-part of Ser. No. 515,872, Oct. 18, 1974, Pat. No. 3,918,230. This application Nov. 10, 1975, Ser. No. 630,504

Int. Cl.² F24J *3/02*

U.S. Cl. 126—271 **10 Claims**

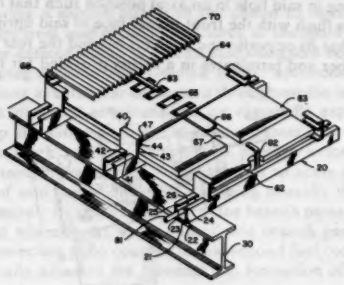
1. A synthetic polymeric surface roof deck structure comprising the combination:

structural purlins;

sub-purlins of sheet metal structural shapes of a box section having a horizontal base, opposing vertical sides and upper horizontal flanges extending inwardly from the top of said sides forming an open slot between the terminus of said flanges, said sub-purlins at right angles to and said base resting on top of said purlins;

formboard adjacent to and secured against the top of said upper horizontal flanges of said sub-purlins and insulating synthetic organic polymer foam on top of said formboard making a formboard-foam assembly;

sheet metal clips having a vertical portion extending upwardly and downwardly from opposing slots, each of said



opposing slots engaging one of said horizontal flanges of said box section when the aixs of said clip and box section are at about 90° to each other, said upwardly extending vertical portion bending to a horizontal portion to engage the top of said formboard-foam assembly securing the formboard against the top of said flanges;

structural sheet roof support shapes fastened to the top of said clips; and

structural polymeric sheet roofing fastened to said support shapes forming the structural sheet and weather surface of said roof deck structure and with said clips and box sections providing a composite structure.

4,006,732

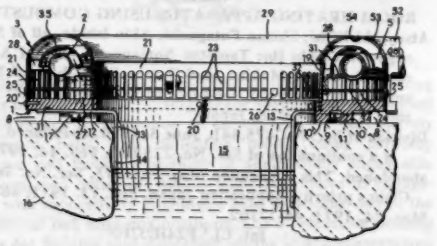
ICE FISHING HEATER

Donald W. Schumm, P.O. Box 246, Leo, Ind. 46765

Filed Mar. 31, 1975, Ser. No. 563,582

Int. Cl.² F23C *5/24*

U.S. Cl. 126—271.1 **13 Claims**



7. A device for preventing water in a hole in a layer of ice from freezing, said device comprising an annular base for disposition on ice above and about a hole and forming an opening, an annular tubular heater means forming an unobstructed opening, means for supporting said heater means above and in spaced relation to said base for locating said unobstructed opening above said base opening, and said heater means being provided with at least one inner outlet port through which heat may be caused to emanate generally

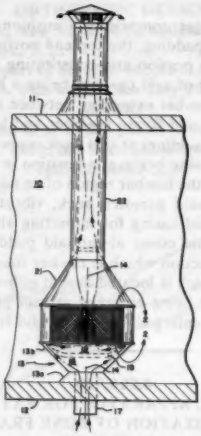
toward the center of the device when connected to means for supplying heat.

4,006,733

FREE STANDING FIREPLACE FOR MOBILE HOMES

Glen D. Crownover, Santa Rosa, Calif., assignor to Malm Fireplaces, Inc., Santa Rosa, Calif.

Filed July 14, 1975, Ser. No. 595,447
Int. Cl.² F24B *13/02*
U.S. Cl. 126—143 4 Claims



1. A free standing fireplace for a mobile home having a floor and ceiling comprising: a base for resting on said floor forming a cavity and having a central vertical axis; elongated vent means having an axis substantially coincident with said central axis forming the lower boundary of said cavity for extending through said floor to the outside atmosphere; concave fire bowl means for retaining fuel suspended in and forming the upper boundary of said cavity said fire bowl means being spaced from the wall of said cavity for forming a flow space from said vent means to said fuel; hood means juxtaposed above said base and fire bowl means; and a chimney connected to said hood and having an axis coincident with said central axis for extending through said ceiling to the outside atmosphere.

4,006,734

STORAGE HEATER BRICKS

Gordon Cunningham Eadie, Wentwood, near Usk, and Christopher Frederick Hinsley, Newport, both of Wales, assignors to British Steel Corporation, London, England

Filed Nov. 26, 1974, Ser. No. 527,437
Int. Cl.² F24H *7/00*; C09K *53/00*
U.S. Cl. 126—400 13 Claims

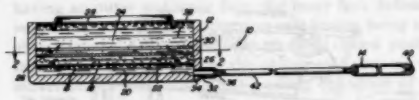
1. A process for producing a heat storage medium which comprises the steps of heating a mix of ferric oxide and an additive including a calcium oxide or a compound capable of yielding a calcium oxide at an elevated temperature effective to react the additive with the ferric oxide to improve its volumetric heat capacity with the mole ratio of the ferric oxide to the calcium oxide residue of said additive lying within the range 0.6:1 to 3.9:1, reducing the reaction product to particles, compacting the particles, and sintering the compacted particles.

4,006,735

PRESSURE SENSOR APPARATUS

Fred Hittman, Baltimore, and Lewis Fleischmann, Randallstown, both of Md., assignors to Hittman Corporation, Columbia, Md.

Filed July 16, 1974, Ser. No. 488,987
Int. Cl.² A61B *5/00*
U.S. Cl. 128—2 A 9 Claims



1. A pressure sensor apparatus comprising a housing having first and second regions, a first non-radioactive fluid contained within said first region and a second non-radioactive fluid contained with said second region, a radioactive fluid contained within said housing between said first and second non-radioactive fluids, said radioactive fluid being immiscible with at least one of said first and second non-radioactive fluids, radiation shielding means associated with said housing for shielding a portion of said radioactive fluid, pressure communication means impermeable to said non-radioactive fluid in communication with said first region so that pressure acting upon said pressure communication means will cause said radioactive fluid to move, and resilient means closing said second region of said housing for permitting movement of said radioactive fluid, said radioactive fluid being moved in said housing as a function of the pressure acting upon said pressure communication means whereby said portion of radioactive fluid shielded by said shielding means varies as a function of said pressure.

4,006,736

ANGIOGRAPHIC INJECTOR

Rudolph J. Kranys, Allison Park; Marlin S. Heilman, Gibsonia; Ronald J. Zdrojkowski, and George R. Swann, both of Pittsburgh, all of Pa., assignors to Medrad, Inc., Pittsburgh, Pa.

Filed Nov. 27, 1974, Ser. No. 527,520
Int. Cl.² A61B *6/00*; A61M *5/20*
U.S. Cl. 128—2 A 31 Claims

1. An apparatus for injecting a contrast media into the vascular system of an animal, the apparatus comprising: a head porton means for supporting a plurality of cartridges housing contrast media and provided with a motor means to drive the contrast media out of said cartridges; and a control unit means; said head portion comprising a rotating turret for housing at least two syringe cartridges in readiness for injection.

4,006,737

ELECTROCARDIOGRAPHIC COMPUTER

Isaac Raymond Cherry, Mission Viejo, Calif., assignor to Del Mar Engineering Laboratories, Los Angeles, Calif.

Filed Jan. 4, 1974, Ser. No. 430,704
Int. Cl.² A61B *5/04*
U.S. Cl. 128—2.06 G 64 Claims

1. A dynamic multispeed ECG for reproducing ECG information contained on a recording medium recorded at a particular speed, including

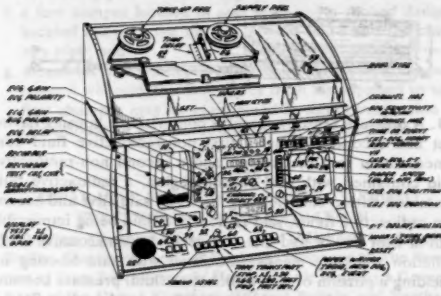
a plurality of readout positions,

first means for moving the recording medium past the plurality of readout positions,

second means coupled to the first means for controlling the first means to move the recording medium at a plurality of speeds including a movement at a particular speed corresponding to the particular speed of recording and including movements of the recording medium at more than one speed greater than the particular speed to pro-

vide real time and multispeed high speed playbacks of the recorded information,

third means located at a first one of the readout positions for reproducing the recorded information when the first means moves the recording medium to provide real time playback,



fifth means coupled to the third and fourth means and responsive to the control of the playback speed by the second means for compensating the reproduced information for frequency and amplitude variations in accordance with the different speeds, and

sixth means coupled to the fifth means and responsive to the compensated reproduced information for producing a visual indication of the reproduced information.

4,006,738

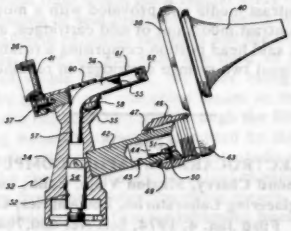
OTOSCOPE CONSTRUCTION

William C. Moore, Skaneateles; John D. Connors, and Richard W. Newman, both of Auburn, all of N.Y., assignors to Welch Allyn, Inc., Skaneateles Falls, N.Y.

Filed June 4, 1975, Ser. No. 583,748

Int. Cl.² A61B 1/22

U.S. Cl. 128—9 **9 Claims**



1. A high light output otoscope comprising an upper portion having a viewing passage therethrough and a base portion adapted to be releasably connected to a battery handle, the upper portion including a removable speculum, a recess in the base portion for receiving a larger than normal otoscope lamp, and a bundle of optical fibers mounted in the otoscope, the bundle having a light receiving end positioned adjacent the lamp and a light emitting end positioned so as to direct light received from the lamp in a path substantially parallel to the viewing passage, the light emitting end of the bundle terminating at a point adjacent the proximal end of the removable speculum and being located close to the projected center line of the speculum.

4,006,739

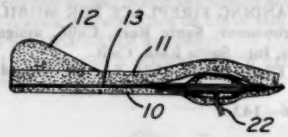
BACK MASSAGER

John F. Wahl, Sterling, Ill., assignor to Wahl Clipper Corporation, Sterling, Ill.

Filed Nov. 7, 1975, Ser. No. 629,780

Int. Cl.² A61H 1/00

U.S. Cl. 128—33 **6 Claims**



1. A back massager comprising a cushion having a front padding and a rear padding, the top end portion of said cushion being the pillow portion and constituting a head rest and the lower third part of said cushion being a back supporting portion, a frame member extending between said paddings, a casing mounted on said frame member and located between said front and rear paddings at said back supporting portion of the cushion, said casing being at a position in which it is substantially even with the lumbar region of an adult person when said cushion is at said person's back, vibratory mechanism contained within said casing for imparting vibrations to said casing, and a flexible cover about said paddings, said front padding having a section which is thicker than the remainder of the sheet and which is located at said pillow portion of the cushion, said cover being enlarged at said pillow portion to accommodate said enlarged section of said front padding.

4,006,740

SURGICAL APPARATUS FOR EXTERNAL TRANSOSTEAL FIXATION OF BONE FRAGMENTS AND JOINT ENDS

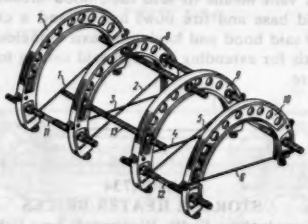
Mstislav Vasilievich Volkov, 1 Stroitelnaya ulitsa 6, kor. 1, kv. 63, and Oganes Vardanovich Oganesian, ulitsa Pervomaiskaya, 74, kv. 87, both of Moscow, U.S.S.R.

Filed July 8, 1975, Ser. No. 593,976

Claims priority, application U.S.S.R., July 22, 1974, 2052127

Int. Cl.² A61F 5/04

U.S. Cl. 128—84 B **4 Claims**



1. In a surgical apparatus for external transosteal fixation of bone fragments and joint ends, a needle to be driven through a bone, said needle having at one end region a relatively sharp tip and at an opposed end region a bulged portion the cross-sectional area of which is greater than the cross-sectional area of the remainder of the needle, a brace having diametrically opposed portions respectively formed with bores which respectively receive said end regions of said needle, said brace carrying at its bore which receives said one end region of the needle which has said relatively sharp tip a screw means which fixes said needle at said one end region thereof to said brace, an axially bored drive screw extending into the bore of the brace which receives the opposed end region of the needle which has the bulged portion, said opposed end region of the

needle extending into the axially bored drive screw, and the latter having in its axial bore a shoulder directed away from the relatively sharp tip of the needle and against which the bulged portion of the needle is seated, said drive screw having an external flat and said brace carrying a set screw engaging said flat to prevent turning of said drive screw, and said drive screw having an external thread, and a nut threaded onto said external thread of said drive screw and cooperating with said brace for urging said drive screw away from said relatively sharp tip of the needle to press the shoulder in the axial bore of the drive screw against said bulged portion of the needle to maintain the latter under tension.

4,006,741

ORTHOPEDIC DEVICE

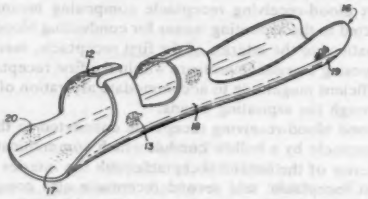
Elmer M. Arluck, New York, N.Y., assignor to Yardney Company, New York, N.Y.

Continuation-in-part of Ser. No. 465,404, April 29, 1974, Pat. No. 3,906,943. This application July 29, 1975, Ser. No. 600,082

The portion of the term of this patent subsequent to Sept. 23, 1992, has been disclaimed.

Int. Cl.² A61F 5/04

U.S. Cl. 128—90 **33 Claims**



1. An integral formable orthopedic device comprising a plastic sheet member and integral therewith an insulating layer on one side of said plastic sheet member; and a protective layer on the other side;

said plastic sheet member being at least about 40 mils thick, and having a tensile strength at yield of at least about 20,000 psi, a flexural strength of between 3,000 and 14,000 psi, a flexural modulus of between about 0.5×10^5 and 7×10^5 psi, a Vicat softening point of between 60° C. and 80° C., and a Rockwell hardness of between 15 on the R scale and 55 on the D scale;

said insulating layer being at least about 10 mils thick and having a coefficient of heat transfer below about 2 cal/-sec/cm²/cm/°C×10^{-4} .

4,006,742

POSITIVE PRESSURE RESUSCITATOR

Stephen Donald Flynn, 7410 Manion Road, Mississauga, Ontario, Canada

Continuation-in-part of Ser. No. 428,823, Dec. 27, 1973. This application June 25, 1975, Ser. No. 590,106

Int. Cl.² A62B 7/02

U.S. Cl. 128—145.8 **4 Claims**

1. Apparatus for the administration of pressurized gases, such as for resuscitation, inhalation or the like, said apparatus comprising;

a chamber having side walls, and an outlet adapted to communicate with patient administration means for administration of said gas;

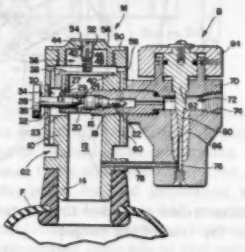
a gas delivery conduit for delivering said gas from a suitable source of gas at an elevated pressure into said chamber said conduit having a free end terminating in said chamber and a gas flow orifice in a side wall thereof adjacent said free end for discharge of gas into said chamber;

a manually operable gas flow control valve disposed in said conduit and movable between a closed position and, when released, remaining in its said closed position, for selective delivery of gas from said gas flow orifice into said chamber;

a normally open, free breathing air vent opening in a side wall of said chamber in registration with the free end of said conduit, permitting unrestricted free inhalation and exhalation through said chamber and said vent opening;

a valve stem extending from said flow control valve, through said vent opening for operation of said valve;

a button on said valve stem, outside said chamber and having an outer and inner face, the inner face defining a vent closure for said vent opening said button being movable between a normally open, and a closed position thereby selectively opening and closing said vent opening movement of said button also causing operation of said



gas flow valve whereby to cause delivery of gas from said orifice to said chamber when the vent opening is closed by the inner face of the button, said vent opening remaining open, and permitting inhalation and exhalation unless mahually closed;

a pressure relief valve opening communicating with said chamber and a valve closure member normally closing the same and being responsive to the development of an overpressure in said chamber for discharging the same to atmosphere;

a gas bypass connection connecting said gas delivery conduit upstream of said flow contol valve with said chamber for receiving gas independently of the control valve;

a gas bypass flow valve disposed in said by-pass connection and manually operable between open and closed positions.

4,006,743

SYSTEM FOR CONTINUOUS WITHDRAWAL OF BLOOD

Avinoam Kowarski, Baltimore, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Division of Ser. No. 323,985, Jan. 15, 1973, Pat. No. 3,908,657. This application June 17, 1975, Ser. No. 587,724

Int. Cl.² A61B 5/00; A61M 1/00

U.S. Cl. 128—214 R **5 Claims**

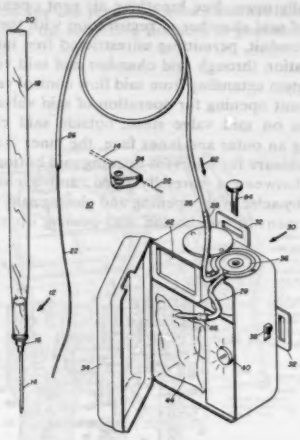
1. A method for continuously withdrawing blood from a subject, comprising the steps of:

inserting a catheter having a nonthrohmbogenic passageway therethrough into a vein of a subject;

causing blood to move continuously from the vein into and through the passageway;

continuously collecting said blood withdrawn through the catheter; and

controlling the continuous withdrawal of said blood slowly from said vein at a pre-determined constant rate and for



a pre-determined extended time during which the catheter is in the vein of the subject.

4,006,744

LOCKING CANNULA MOUNT

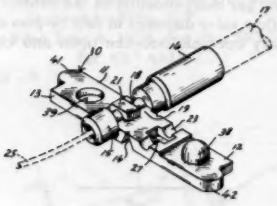
Peter Leslie Steer, East Grinstead, England, assignor to Abbott Laboratories, North Chicago, Ill.

Filed June 23, 1975, Ser. No. 589,278

Claims priority, application United Kingdom, June 24, 1974, 27854/74

Int. Cl.² A61M *5/00*

U.S. Cl. 128—214 R **10 Claims**



1. A device for securing a length of cannula tubing to facilitate the introduction of fluids into said tubing comprising:

a body member defining an inlet passage for said cannula tubing,

an opposing entry passage for contact with a source of fluid and an intermediate section,

a length of intermediate flexible tubing secured to said intermediate section and communicating with said opposing inlet and entry passages,

said length of intermediate flexible tubing adapted to receive an end portion of said cannula tubing,

means to secure said length of intermediate flexible tubing between said inlet and entry passages,

said body member further defining a hinged clamping member constructed and arranged to engage said intermediate flexible tubing and to compress said intermediate tubing against said cannula tubing in a fluid tight manner,

and means operatively associated with said body member to tentatively retain said hinged clamping member in engagement with said intermediate flexible tubing.

4,006,745

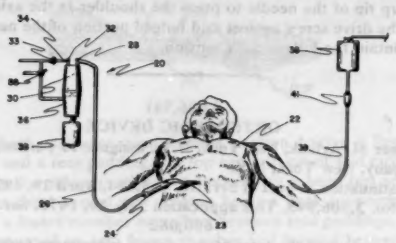
AUTOLOGOUS TRANSFUSION SYSTEM AND METHOD

James L. Sorenson; Karl A. Pannier, Jr., both of Salt Lake City, and Gordon S. Reynolds, Bountiful, all of Utah, assignors to Sorenson Research Co., Inc., Salt Lake City, Utah

Continuation-in-part of Ser. No. 580,087, May 22, 1975. This application Nov. 13, 1975, Ser. No. 631,584

Int. Cl.² A61M *1/00, 5/00*

U.S. Cl. 128—214 R **22 Claims**



1. An autologous transfusion system comprising in combination:

means for aspirating blood from a patient;

a first blood-receiving receptacle comprising means connected to the aspirating means for conducting blood from a patient to the interior of the first receptacle, means for imposing a negative pressure within the first receptacle of sufficient magnitude to accommodate aspiration of blood through the aspirating means;

a second blood-receiving receptacle connected to the first receptacle by a hollow conduit which communicates the interior of the second receptacle with the interior of the first receptacle, said second receptacle also comprising means for unidirectionally controlling blood flow from the first to the second receptacle;

means for conducting a pressurizing fluid selectively into and out of the second receptacle;

means for reducing the pressure exerted by the pressurizing fluid in the second receptacle below the pressure in the first receptacle so as to transfer blood from the first to the second receptacle;

means for removably attaching a blood transfer bag to the second receptacle so that blood communication from the second receptacle to the blood transfer bag is accommodated; and

means for delivering the pressurizing fluid under positive pressure to the second receptacle of sufficient magnitude in relation to the pressure maintained in the first receptacle to expel the blood from the second receptacle into the blood transfer bag without interrupting the negative pressure in the first receptacle.

4,006,746

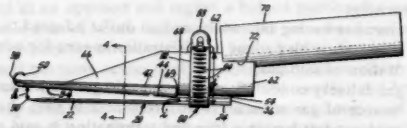
SURGICAL KNIFE

John Edwards, 645 Riverside Ave., Fort Wayne, Ind. 46805

Filed Apr. 28, 1975, Ser. No. 572,108

Int. Cl.² A61B *17/32*; B26B *29/00*

U.S. Cl. 128—305 **7 Claims**



1. A surgical knife assembly comprising:

a handle portion;

an elongated knife blade having a cutting edge and a trans-

versely spaced opposite edge; said knife blade being secured at its base end to said handle portion;

an elongated blade guide secured at a base end to said handle portion in overlying spaced relation to said blade and having a surface portion overlying said blade in substantial parallelism therewith and defining a cutting clearance therebetween;

said blade guide having a transverse dimension greater than the transverse dimension of said knife blade;

said blade guide extending transversely beyond the opposite edges of said blade, respectively, a distance to resist tilting of the blade about its longitudinal axis when the latter is inserted into the flesh in a position which disposes the blade guide surface portion in flat engagement with a patient's skin;

said guide having a base edge, a distal edge and two side edges, said side edges being substantially longer than said distal and base edges, said guide being tapered from said base edge to said distal edge with one side edge being substantially parallel to said cutting edge,

said side edges and said distal edge being arcuately formed to provide a rounded edge surface extending away from the plane of said knife blade; and

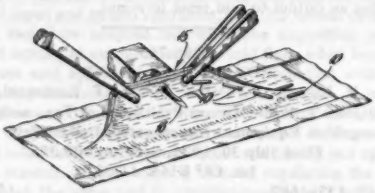
a guide shank on said base edge and extending longitudinally therefrom.

4,006,747

SURGICAL METHOD

Richard L. Kronenthal, Fairlawn, and Matthew H. Wykoff, Somerville, both of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Filed Apr. 23, 1975, Ser. No. 571,043
Int. Cl.² A61B 17/04
U.S. Cl. 128—335 **15 Claims**



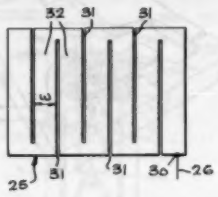
1. A method of closing a wound or incision in mammalian tissue to facilitate the healing thereof which comprises (a) approximating the tissue at the wound; (b) inserting a hollow needle through the approximated tissue and across the wound whereby the needle is in communication with the surface of the tissue on either side of the wound; (c) passing one end of a fastener device comprising a filament member terminated at each end by first and second anchoring means through the hollow needle until said first anchoring means at one end of the fastener device is discharged from the end of said needle external of said tissue on one side of said wound; and (d) withdrawing the hollow needle from the tissue while maintaining the fastener device substantially stationary relative to the tissue until said fastener device is disengaged from the needle with said second anchoring means external of said tissue on the other side of said wound, whereby the fastener device remains in the tissue with the filament member traversing the wound through the tissue and with said first and second anchoring means maintaining the tissue in approximation at the wound from points on the surface of the tissue on either side of the wound.

4,006,748

IMPLANTABLE UNIPOLAR PACEMAKER WITH IMPROVED OUTER ELECTRODE PLATE

Joseph H. Schulman, Los Angeles, Calif., assignor to Pacesttter Systems, Inc., Sylmar, Calif.

Filed Jan. 29, 1976, Ser. No. 653,463
Int. Cl.² A61N 1/04
U.S. Cl. 128—419 P **19 Claims**



1. In a unipolar implantable living tissue stimulator of the type including pulse generating means, a stimulating electrode electrically connected to said pulse generating means and locatable at the tissue to be stimulated by pulses supplied to said stimulating electrodes by said generating means, and outer electrode means connected to said generating means and in direct electrical contact with body saline solution which extends from said stimulating electrode to said outer electrode means to thereby provide an electrical conductive path therebetween, the improvement comprising:

outer electrode means defining an electrically conductive surface of preselected area which is in direct electrical contact with the body saline solution when said stimulator is implanted in a body, said outer electrode means defining a plurality of electrically conductive elements whereby any substantially square area on the surface of any of said elements does not exceed a preselected maximum value which is significantly smaller than the total area of the conductive surface of said outer electrode means.

4,006,749

REMOVAL OF HARMFUL COMPONENTS FROM TOBACCO SMOKE

Carl Horowitz; Michael Dichter; Nathan Abrams, all of Brooklyn, and Duryodhan Mangaraj, Staten Island, all of N.Y., assignors to Consolidated Cigar Corporation, New York, N.Y.

Filed Jan. 31, 1975, Ser. No. 545,988
Int. Cl.² A24B 15/07
U.S. Cl. 131—17 R **26 Claims**

1. A method of activating tobacco to remove an undesirable component of tobacco smoke passing therethrough, the method comprising grafting a polymer onto the tobacco substrate, the polymer having free functional groups available active to combine with and retain the undesirable component of the tobacco smoke which it is desired to remove.

4,006,750

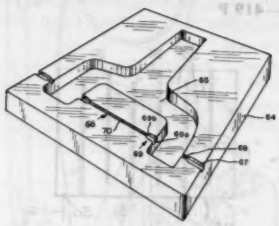
DISPOSABLE FLOSSER

Ingram S. Chodorow, Hartsdale, N.Y., assignor to Placontrol Inc., Briarcliff Manor, N.Y.

Continuation-in-part of Ser. No. 267,219, June 28, 1972, abandoned. This application Dec. 28, 1973, Ser. No. 429,654
Int. Cl.² A61C 15/00
U.S. Cl. 132—91 **6 Claims**

1. A method of making from fluid plastic a solid flosser having a handle part and extending therefrom two arms spaced apart with a strand of floss having a central part spanning the space between said arms and having end-parts embedded within said arms, the method comprising forming a

mold and cavity therein defining handle and arm parts corresponding closely to said handle and arm parts of said flosser, positioning the central part of a strand of floss to span the space between said arms of the cavity and said end parts to traverse said arms of the cavity prior to flowing fluid plastic therein, flowing fluid plastic into said cavity by an injection



molding process, and thereby embedding with plastic said end parts of the strand in said arm parts of the cavity, and thus coating with said plastic substantially the entire outer peripheral surface of said end-parts, hardening said fluid plastic and thereby in substantially a single step forming said solid flosser and securing said floss end-parts in and integrally with the flosser's arm parts.

4,006,751

METHOD AND APPARATUS FOR ROTATING HYDRAULIC CONTROL RODS

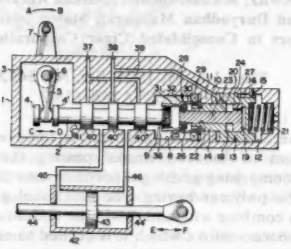
Toshio Kamimura, Gifu, Japan, assignor to Teijin Seiki Co., Ltd., Osaka, Japan

Filed Nov. 12, 1975, Ser. No. 631,397

Claims priority, application Japan, Mar. 11, 1975, 50-29734

Int. Cl.² F16K *29/00*

U.S. Cl. 137—1 **4 Claims**



1. A method for imparting rotational movement to a control rod which is inserted reciprocably in a hydraulic circuit to control flow of fluid pressure from a pressure source to an actuator, comprising:

providing a rotating mechanism in disengageable association with one end of said control rod;

driving said rotating mechanism to engage and rotate said control rod at a suitable time during operation of said hydraulic circuit; and,

by-passing operating fluid pressure of said hydraulic circuit to said rotating mechanism, thereby driving said rotating mechanism to engage and rotate said control rod upon actuation of said hydraulic circuit.

4,006,752

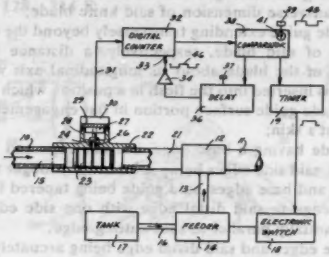
CONTROL FOR FLUID FLOW SYSTEM

Donald P. De Vale, Sycamore, Ill., assignor to Everpure, Inc., Westmont, Ill.

Filed Oct. 24, 1975, Ser. No. 625,535

Int. Cl.² G05D *11/00*

U.S. Cl. 137—101.21 **7 Claims**



1. Apparatus for supplying an additive to a fluid flowing in a pipe comprising a magnet rotatably supported and driven by said fluid such that it rotates at a speed proportional to the velocity of the fluid, a Hall effect device mounted adjacent said magnet and producing output pulses in response to rotation of the magnet, a digital counter receiving the output of said Hall effect device and counting said output pulses, a comparator having a preset count receiving the output of said counter and having two different output states corresponding to the conditions when said comparator has received less pulses from said counter than said preset count and pulses equal to said present count, a timer receiving an output of said comparator, an electronic switch receiving the output of said timer, a feeder connected to said pipe and receiving an output of said electronic switch and controlled by said comparator to turn the feeder off and on in response to said two states of said comparator, and a container connected to said feeder to supply an additive to said fluid when said feeder is on, and wherein said counter has a reset terminal and said comparator supplies an output to said reset terminal.

4,006,753

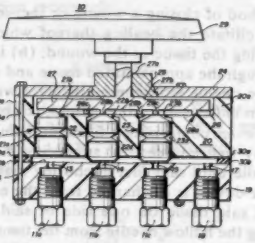
ROTARY DISC VALVE

James R. Ingram, Jr., Dallas; Richard T. Kushmaul, Irving, and John T. White, Grand Prairie, all of Tex., assignors to Recognition Equipment Incorporated, Dallas, Tex.

Filed July 30, 1975, Ser. No. 600,398

Int. Cl.² F16K *11/00*

U.S. Cl. 137—607 **15 Claims**



1. A valve system for controlling the flow of fluids from a pressurized source, which comprises:

a. a valve plate having a plurality of valves positioned therein, each valve including first and second pistons, a pair of spacer discs interposed between said pistons and a spring means interposed between said pair of spacer discs;

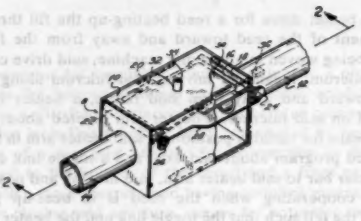
b. a reservoir plate having a plurality of inlet parts and an outlet part, each of said inlet parts facing one of said valves;
c. a resilient diaphragm interposed between said valve plate and said reservoir plate for isolating said plurality of valves from the flow of said fluids;
d. a conduit diaphragm interposed between said resilient diaphragm and said reservoir plate, and having a central opening of width corresponding to the width of said valve and providing fluid communications between all of said parts; and
e. a single cam means contiguous to the side of said valve plate opposite said diaphragms actuating said valves in sequence to force said resilient diaphragm onto said inlet parts and to close the same.

4,006,754

FLUID PRESSURE OPERATED VALVE

William T. Houston, Star Rte. 93B, Oak Drive off Bald Rock Road, Berry Creek, Calif. 95916

Filed May 19, 1975, Ser. No. 578,487
Int. Cl.² F16K *31/126*
U.S. Cl. 137—614.21 **2 Claims**



1. A fluid pressure operated valve comprising:
a. a housing formed with an input aperture and an output aperture;
b. flap means movable in said housing and adapted to close said input and output apertures, said flap means comprising two flaps adapted for respective imposition across said input and output apertures, said flaps when imposed across said apertures forming in combination with said housing an uninterrupted enclosure;
c. an elastomeric expansible means positioned in said housing adapted to be coupled to a source of fluid pressure and selectively operable to expand and tightly seal against the interior of said housing thereby regulating the flow through the valve and to simultaneously drive said flaps into closing engagement across their respective input and output apertures, said expansible means in its fully expanded condition being contained by the enclosure formed by said flap means and said housing; and
d. means to synchronize the movement of said flaps, said synchronizing means comprising crank means driven by said flaps and link means coupling said crank means to effect synchronous movement thereof.

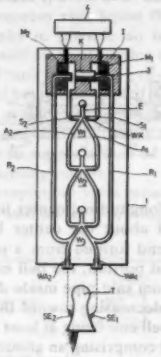
4,006,755

ELECTROFLUIDIC CONVERTER

Walter Kranz, Taufkirchen, and Heinz Tillmann, Ottobrunn, both of Germany, assignors to Messerschmitt-Bolkow-Blohm GmbH, Germany

Filed Oct. 22, 1975, Ser. No. 624,842
Claims priority, application Germany, Oct. 23, 1974, 2450329
Int. Cl.² F15C *1/08*
U.S. Cl. 137—831 **5 Claims**

1. An electrofluidic converter, for converting electric signals into corresponding fluid signals, comprising, in combination, a plurality of series-connected bistable fluidic elements each having a supply input, for pressurized fluid, two outputs separated by a jet splitter, and two control inputs, the outputs of each bistable fluidic element being connected to respective control inputs of the next preceding fluidic element; respective feedback conduits branched from the outputs of the last fluidic element and connected, in a chamber sealed against atmospheric pressure, to the control inputs of the first fluidic element; electromagnetic valve means in said sealed chamber



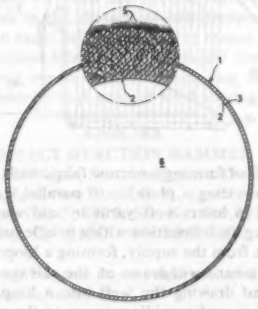
operable to alternately close or clear said feedback conduits; and an electric control circuit energization of said electromagnetic valve means to effect switching thereof between closing and clearing positions; said plurality of series-connected bistable fluidic elements providing a constant phase lag between an electric switching signal effecting closing of one feedback conduit, and the fluidic output signal of said one feedback conduit, for seating of said valve means before application of a counter-fluid-pressure thereto.

4,006,756

FIBER REINFORCED REGENERATED CELLULOSE SAUSAGE CASING FOR DRY SAUSAGES

Günter Gerigk, Oberursel, and Rudolf Stryk, Wiesbaden-Bierstadt, both of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed Sept. 13, 1972, Ser. No. 288,479
Claims priority, application Germany, Sept. 15, 1971, 7135052[U]
Int. Cl.² A22C *13/00*
U.S. Cl. 138—118.1 **1 Claim**



1. In a regenerated cellulose sausage casing having a fiber fleece embedded therein, for dry sausages,
the improvement comprising an outer surface exhibiting at least part of the fibrous roughness of the fiber fleece embedded therein.

4,006,757

PIPE BELL END HAVING A THICKENED PORTION AND APPARATUS FOR FORMING THE BELL END

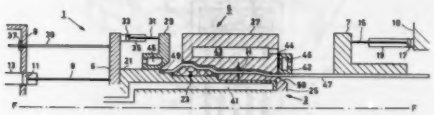
Petrus Marinus Acda, and Jacob Karreman, both of Enkhuizen, Netherlands, assignors to Polva Nederland B.V., Netherlands

Filed Aug. 26, 1975, Ser. No. 607,770

Claims priority, application Netherlands, Feb. 28, 1975, 7502374

Int. Cl.² F16L 9/00, 11/00

U.S. Cl. 138—109 5 Claims



1. A pipe having a longitudinal center line, a wall of given thickness symmetrical about the center line, a pipe inside diameter, and a bell end formed from a portion of the pipe wall and having an end portion, the bell end having an inner diameter increasing from said pipe inside diameter to a maximum value and then decreasing toward the end portion, the wall thickness of the bell end being at least equal to said given thickness, the bell end comprising an annular sealing chamber having a sealing face, wherein the wall thickness increases in the direction of the end portion of the bell up to a maximum wall thickness at the sealing face.

4,006,758

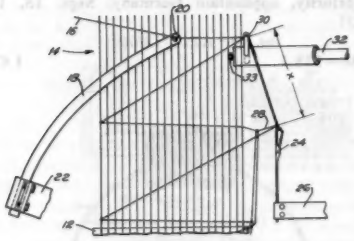
NARROW WEB LOOM

Carl F. Libby, 1212 West St., Stoughton, Mass. 02072

Filed Aug. 15, 1975, Ser. No. 604,957

Int. Cl.² D03D 47/04, 47/42, 45/50

U.S. Cl. 139—116 3 Claims



1. A method of forming a narrow fabric with low pick count comprising providing a plurality of parallel warp yarns, providing means to insert weft yarns in said warp in alternate sheds, catching each insertion with a needle on the side of the warp opposite from the supply, forming a loop of weft yarn as the insertion means withdraws on the selvage edge adjacent the needle and drawing the weft into a loop previously inserted weft yarn, and providing means on the side of the warp remote from the supply to engage the weft in its withdrawal movement that will determine the amount of inserted weft yarn and establish a measured loop as the weft is drawn into a previously inserted weft yarn loop, the inserted weft yarn in one shed lying at an acute angle to its position in the previous and successive sheds.

4,006,759

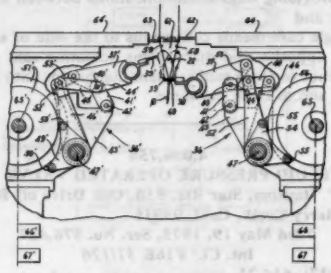
LOCKED TOGGLE BEATER DRIVE FOR TRIAXIAL WEAVING MACHINE

Burns Darsie, Rockford, Ill., assignor to Barber-Colman Company, Rockford, Ill.

Filed Apr. 21, 1976, Ser. No. 678,943

Int. Cl.² D03D 49/68, 41/00

U.S. Cl. 139—191 8 Claims



1. A beater drive for a reed beating-up the fill threads by movement of the reed toward and away from the fell of a fabric being woven in a weaving machine, said drive comprising a fulcrum, means for moving said fulcrum along a fixed path toward and away from said fabric, a beater bar arm pivoted on said fulcrum, a beater arm pivoted about a fixed axis, means for variably positioning said beater arm in a predetermined program about said axis, and a toggle link coupling the beater bar to said beater arm, said moving and positioning means cooperating when the reed is in beat-up position against the fell such that the toggle link and the beater arm are maintained in substantially aligned compression.

4,006,760

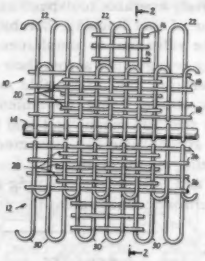
FABRIC CONNECTOR SEAM

Eric R. Romanski, Delmar, and Orrin C. Stevens, Greenville, both of N.Y., assignors to Albany International Corporation, Albany, N.Y.

Filed Jan. 8, 1976, Ser. No. 647,616

Int. Cl.² D03D 25/00; D21F 7/10, 1/12

U.S. Cl. 139—383 A 7 Claims



1. A fabric connector seam having two identical seam-halves joined by a pintle in which each seam-half contains first, second and third warp systems and a single filling system, said first and second warp systems respectively providing with said filling, face and back weaves, said face weave overlying said back weave for a portion thereof providing a double layer zone and said third warp system binding said face and back weaves together in the double layer zone, and said filling system woven in folded position along an edge to enable said face weave to overly said back weave to form alternately

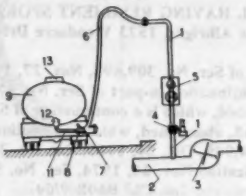
displaced protruding loops along said edge for intermeshing with like loops formed along the edge of a like seam-half for receipt of said pintle.

4,006,761

EQUIPMENT FOR BOTTOM LOADING OF LIQUID PRODUCTS

Maurice Bonafous, Gurmencon, France, assignor to Applications Mecaniques et Robinetterie Industrielles A.M.R.I., Paris, France

Filed Apr. 23, 1975, Ser. No. 570,797
Claims priority, application France, May 2, 1974, 74.15261
Int. Cl.² B65B *3/30*
U.S. Cl. 141—94 **17 Claims**



1. Apparatus for supplying a liquid product to a pipe connected to the bottom of vessel from a flexible conduit connected to a distribution station, said apparatus comprising a tank valve including a hollow body constituted by two parts inclusive of a rear part adapted for connection to the pipe connected to the bottom of the vessel and a front part provided with a large aperture and having coupling means, a flap valve for closing said aperture, means for actuating said flap valve comprising a connecting rod supporting said flap valve, a profiled lever forming a knuckle joint with said connecting rod, an operating shaft rotatably supported by said hollow body, a gusset connected to said operating shaft, said profiled lever being pivotably connected to said gusset, an operating lever extended externally of said body and connected to said shaft to rotate the same,

a coupling for connection with the coupling means of the tank valve and the flexible conduit connected to the distribution station, said coupling comprising a main casing connected to the flexible conduit, a connecting nose on said casing for lockable connection with the coupling means of the body of the tank valve, a rear casing including mechanical and hydraulic safety means, a closure member in said main casing for controlling flow of liquid product from the flexible conduit to the tank valve and means for actuating said closure member by remote control,

said flap valve being applied against said closure member in coupled and closed position of the tank valve such that upon separation of the tank valve from the coupling at the end of supply of liquid to the vessel only a negligible guantity of liquid product is released.

4,006,762

FUEL TANK LEVEL DETECTOR AND SHUT-OFF VALVE

Everett H. Badger, La Habra, Calif., assignor to Textron, Inc.

Filed Aug. 11, 1975, Ser. No. 603,424
Int. Cl.² B65B *3/26, 57/14*
U.S. Cl. 141—198 **14 Claims**

1. A liquid level control system for disposition in a tank and for use in automatically shutting off liquid flow when a desired liquid level in said tank has been reached, said system comprising:

a. inlet valve means coupled to said tank to receive liquid under pressure from a source thereof, said inlet valve means being normally closed and opened responsive to said liquid under pressure thereby to provide liquid flow through said inlet valve means directly into said tank, said inlet valve means also having means responsive to a flow of liquid in a predetermined direction to close said inlet valve means:

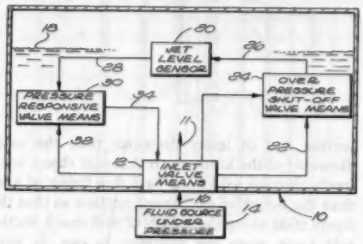
b. jet level sensing means having an input and an output for detecting the level of liquid in a tank, said jet level sensing means including

1. ejector means for providing liquid flow into said tank,

2. receiver means spaced from said ejector means and aligned to receive said liquid flow from said ejector means thereby to provide an output liquid pressure signal from said jet level sensing means when the liquid level in said tank is below a pre-determined level, said output signal being interrupted when the liquid level in said tank is at said pre-determined level;

c. means connecting said inlet valve means to said jet level sensing means to supply a flow of liquid to the input of said jet level sensing means;

d. first pressure responsive valve means connected between said output of said jet level sensing means and said inlet



valve, said valve means being movable from a first position into a second position responsive to said output liquid pressure signal from said jet level sensing means, and includes means to retain said valve in said first position in the absence of said output liquid pressure signal, said connection between said first valve means and said inlet valve providing flow of liquid from said source, through said first valve means when in said first position, and to said inlet valve to close said means responsive to a flow of liquid in a predetermined direction of said inlet valve; and

e. second pressure responsive valve means disposed in said connecting means, said second valve means being movable from a first position to a second position responsive to a predetermined liquid pressure in said tank and includes means to retain said second valve means in said first position in the absence of said predetermined pressure in said tank, said second valve means when in said second position interrupting the liquid flow to said jet level sensing means thereby precluding liquid leakage into said tank through said jet level sensing means.

4,006,763

IMPACT REACTION HAMMER

Emil Ordonez, Las Vegas, Nev., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Oct. 3, 1975, Ser. No. 619,402
Int. Cl.² B25C *1/00;* **B25D** *1/00*
U.S. Cl. 145—29 R **2 Claims**

1. An improved hammer for manual use, comprising

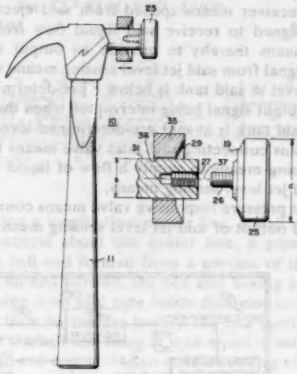
a hammer head fastened to

a handle,

said hammer head formed with a cylindrical shank section projecting from the juncture of the hammer head and attached handle, and with said shank section extending along an axis generally perpendicular to the axis of the handle, with a knob detachably fastened to an end of the said shank section,

said knob being of a generally cylindrical shape, with the sectional diameter of the external cylindrical surface of the knob being greater than the sectional diameter of the external cylindrical surface of the said shank section, together with

a weighted closed ring loosely fitted about said shank section, said ring formed with a circular hole of greater diameter than the said sectional diameter of the shank



section and of lesser diameter than the said sectional diameter of the knob, such that said shank section passes freely through said hole, said ring being of a lesser width than the length of said shank section so that the ring may freely slide along the length of said shank section to strike said knob when the hammer, in use, in swung by the handle to cause the knob to impact against an object,

said closed ring being removable from said shank section when the shank section is detached from the knob.

4,006,764

PROTECTION CASE FOR TAPE-RECORDER OR RADIO-SET

Kozo Yamamoto, Hirakata, and Takuro Ibi, Kashiwazaki, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

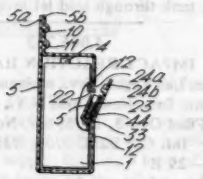
Filed Oct. 8, 1974, Ser. No. 513,134

Claims priority, application Japan, Oct. 12, 1973, 48-119303[U]; Oct. 12, 1973, 48-119304[U]; Oct. 12, 1973, 48-119305[U]; Oct. 15, 1973, 48-119986[U]; Oct. 15, 1973, 48-119987[U]

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² B65D *65/06*

U.S. Cl. 150—52 R **1 Claim**



1. A protection case for an audio instrument and operational controls, having speakers, said case being formed of waterproof sheet material in a shape roughly conforming to the shape of said instrument, said case having a first opening through which said instrument can be inserted and taken out, with plastic engaging portions on opposing surfaces adjacent said first opening to form a zipper for closing said opening in air and water tight relation with said instrument therein, said case further having a region of reduced thickness on the inner surface thereof so as to form an air space between said speaker and said case, said case further having a plurality of flexible bellows adjacent said control for operating said controls by manually flexing said bellows, said case further having transparent and opaque portions with the transparent portions being located so as to permit viewing from outside of the operation of said instrument, and said case having a further opening for inserting a cassette into said case with engaging portions of opposing surfaces adjacent said further opening to form a zipper for closing said further opening in air and water tight relation with said instrument therein.

4,006,765

WHEEL HAVING RESILIENT SPOKE MEANS

Penrose Lucas Albright, 1523 Woodacre Drive, McLean, Va. 22101

Continuation of Ser. No. 309,698, Nov. 27, 1972, abandoned, which is a continuation-in-part of Ser. No. 871,656, Nov. 14, 1969, abandoned, which is a continuation of Ser. No. 725,336, April 30, 1968, abandoned, which is a continuation-in-part of Ser. No. 504,949, Oct. 24, 1965, Pat. No. 3,380,779. This application Nov. 25, 1974, Ser. No. 527,018

Int. Cl.² B60B *9/04*

U.S. Cl. 152—12 **9 Claims**

1. A wheel which comprises axle means, an expansible periphery means, resilient means including spoke means interconnecting said axle means and said expansible periphery means and lying in a conical surface having its apex in said axle means, whereby said spoke means are resiliently movable relative to said axle means in directions substantially parallel to the wheel's axis of rotation, said periphery means and said resilient means being rigidly secured by securing means to said axle means, said periphery means, said resilient means and said securing means comprising an endless member composed of resilient material.

4,006,766

RADIAL TIRES

Toshiaki Takayanagi, Kodaira; Hiroaki Tsubakihara, Kurume, and Hiroshi Fukuyama, Higashi-Murayama, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Division of Ser. No. 464,667, April 26, 1974, abandoned, which is a continuation of Ser. No. 212,937, Dec. 28, 1971, abandoned. This application July 9, 1975, Ser. No. 594,539

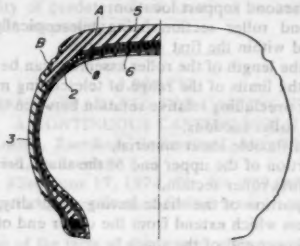
Claims priority, application Japan, Dec. 29, 1970, 46-120690

Int. Cl.² B60C *9/04*

U.S. Cl. 152—354 **6 Claims**

1. A pneumatic radial tire comprising a carcass means having at least one rubberized carcass ply consisting of cords disposed at 70° to 90° to the equatorial direction of the tire, a pair of flexible side rubber layers secured to said carcass ply and forming the outer covering of the sidewalls, each side rubber layer composed of flexible rubber having a Shore A

hardness upon vulcanization of 40° to 55°, a rubberized breaker layer and a tread rubber layer secured to the tire crown, said breaker layer consisting of cords disposed at 10° to 30° to the equatorial direction of the tire, said tread rubber layer having a width substantially equal to the width of the tire crown and at least a portion of the shoulders and being made of a highly abrasion-resistant hard rubber material with a Shore A hardness upon vulcanization of 55° to 75°, each of said flexible side rubber layers integrally bonded to said tread



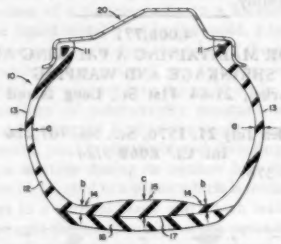
rubber layer to cover the respective opposing side edges thereof, each of said flexible side rubber layers extending over the respective edge portion of the tread rubber layer and being bonded thereto, and each of said flexible side rubber layers further extending underneath the respective edge portion of the tread rubber layer and being bonded between the bottom of the tread rubber layer and the carcass to form a tire having protective flexible rubber covering the opposing side edges of the abrasion-resistant hard tread rubber.

4,006,767

PNEUMATIC TIRES

John Learned Ford, N. Canton, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Oct. 8, 1975, Ser. No. 620,514
Int. Cl.² B60C *5/12, 1/00*
U.S. Cl. 152—357 A **6 Claims**



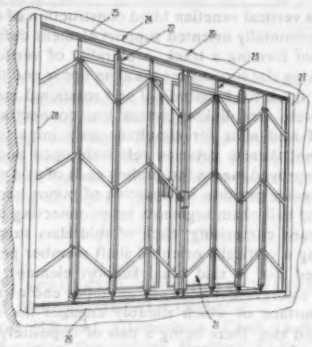
1. A cordless, pneumatic tire comprising an annular, rubber tread and a cast body of viscoelastic material having a Young's modulus of between 5,000 and 15,000 psi, said body having an annular crown region located between two annular shoulder regions and sidewall regions connecting the outer edges of said shoulder regions to tire beads, said crown and shoulder regions located underneath said rubber tread and axially inwardly of the outermost edges of said rubber tread, said crown region having a crown section measured at the circumferential centerline of the tire, each said shoulder region having a shoulder section measured at the thinnest point of said shoulder region and each said sidewall region having a mid-sidewall section measured at the maximum axial width of the sidewall on standard inflation, said crown section having a structural stiffness at least 4 times the structural stiffness of said mid-sidewall section and said shoulder section having a structural stiffness at least 1.5 times the structural stiffness of said mid-sidewall section, said structural stiffness of said crown being substantially greater than said structural stiffness of said shoulder section.

4,006,768

SECURITY SCREEN

William J. Horgan, Jr., Pittsburgh, Pa., assignor to Blumcraft of Pittsburgh, Pittsburgh, Pa.

Filed Nov. 22, 1974, Ser. No. 526,101
Int. Cl.² E06B *3/92*
U.S. Cl. 160—136 **18 Claims**



1. A foldable security screen apparatus of the optionally openable and closeable type for use in covering an opening of the window, door or other types comprising:

a. a plurality of longitudinally disposed laterally repositionable bars,

b. a plurality of links extending between and connecting adjacent said bars, each link having one end pivotally anchored on a said bar and each pivotally connected at its opposite end to a next adjacent said bar,

c. guide means disposed at opposite ends of said bars forming guide paths for guiding the lateral movement of said bars upon lateral repositioning thereof, wherein said guide means comprise laterally movable means at the ends of said bars and fixedly disposed track means for guiding movement of said laterally movable means relative thereto,

d. said bars each being connected to said guide means at both opposite ends of each said bar,

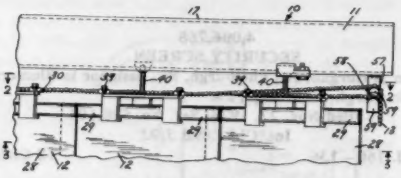
e. said bars being telescopically extensible and contractible and comprising means that include main bar portions between bar ends, for expansion and contraction in effective bar length between said guide means whereby the bars can automatically accommodate to variations in said guide paths by permitting corresponding automatic variations in effective bar length between ends thereof, whereby the bars can, upon installation optionally accommodate an infinite variety of opening lengths within a preselected range, and whereby the bars facilitate screen opening by lengthwise movement of some of the main bar portions relative to associated said bar ends, and

f. said bars including means for selectively limiting relative telescopic movement between at least some of said main bar portions and associated bar ends, whereby upon installation the spacing between selected ones of said bars may be optionally adjusted for accommodating an infinite variety of lateral opening sizes within a preselected range, and whereby desired selected spacings between adjacent bars may be established.

4,006,769
VERTICAL VENETIAN BLIND CONSTRUCTION

Allan S. Woodle, 420 Mount Pleasant Ave., Mamaroneck, N.Y. 10543

Filed June 22, 1976, Ser. No. 698,530
Int. Cl.² E06B 9/26
U.S. Cl. 160—166 A 3 Claims

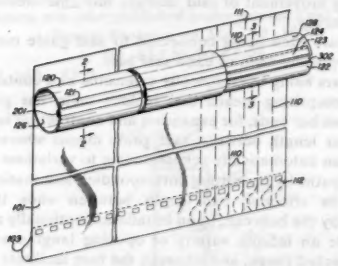


1. In a vertical venetian blind construction of a type including a horizontally oriented support element defining an elongated slot forming a track, a plurality of vertically oriented slats having slat support means at an upper end thereof engaging said track for longitudinal and rotational movement relative thereto, and linking means interconnecting portions of each of said slats for simultaneously imparting rotational movement thereto between relatively open and closed positions, improved means for guiding each of said slats to a common angular position irrespective of minor variations in the length of ball chain segments interconnecting adjacent slats, said means comprising: each of said slats support elements including a vertically oriented shaft member penetrating said elongated slot in said blind support element, a spherically shaped enlargement adjacent an upper end of said shaft, the lower surface of which slidably engages the edges of said elongated slot, there being a pair of oppositely disposed flat surfaces forming camming detents extending inwardly from the spherical surfaces thereof, and adapted to rest upon said edges of said elongated slot when said slats are in relatively closed condition in which the longitudinal edges of said slats are in mutually overlapped relation.

4,006,770
WINDOW SHADE ASSEMBLY

Thomas A. Ferguson, 411 W. Galena, Freeport, Ill. 61032

Filed June 16, 1975, Ser. No. 586,873
Int. Cl.² A47G 5/02
U.S. Cl. 160—263 12 Claims



1. In an extensible and retractable roll window shade assembly which is width adjustable and installable by the consumer without the use of tools or cutting elements, the combination of

a telescoping roller assembly, said telescoping roller assembly including

a first roller section,

said first roller section having a constant external diameter from end portion to end portion,

the outer end portion of said first roller section having first means for supporting the window shade assembly from a first support location,

the inner end portion of said first roller section having an opening therein of a size to receive

a second roller section,

said second roller section having a constant nominal external diameter from end portion to end portion,

the outer end portion of said second roller section having second means for supporting the window shade assembly from a second support location,

said second roller section being telescopically, slidably received within the first roller section

whereby the length of the roller assembly can be adjustable within the limits of the range of telescoping movement,

means for precluding relative rotation between the first and second roller sections,

a shade of flexible sheet material,

a first portion of the upper end of the shade being secured to the first roller section,

one side portion of the shade having a plurality of lines of weakness which extend from the upper end of the shade to the lower end of the shade

whereby the width of the shade can be adjusted to a desired width by separating a portion of the side of the shade from the balance of the shade, said separated portion being bounded, on the outside, by the original shade edge and, on the inside, by a line of weakness along which said portion is separated from the balance of the shade,

said first and second telescoping roller sections being adjustable to an overall length which is at least as wide as the length of the final shade width without severance of any portion of either section,

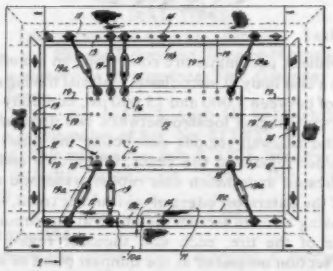
securement means for securing the second portion of the upper end of the shade, which is generally aligned with the second roller section, in fixed relationship to the second, smaller external diameter roller section with a substantially constant securing force from point to point along the length of the portion of the second roller section which extends beyond the end of the first roller section,

whereby the positions of the first and second roller sections are fixed with respect to one another and to the shade throughout the entire area of overlap of the shade and the roller assembly.

4,006,771
MEANS FOR MAINTAINING A PAINTING AGAINST SHRINKAGE AND WARPING

Hermann Spurkel, 21-64 41st St., Long Island City, N.Y. 11105

Filed July 21, 1976, Ser. No. 707,226
Int. Cl.² E06B 9/24
U.S. Cl. 160—378 4 Claims



1. The combination with a painting on a canvas, comprising:

a. a rigid frame having frontward and rearward sides;

b. the canvas surmounting the frontward side of said frame and overlapping the rearward side thereof;

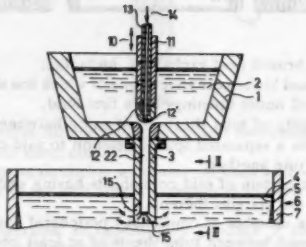
c. a rigid member disposed within the frame and rearwardly of the canvas surmounting the frontward side of the frame;
d. supporting means engaging the edges of the canvas overlapping the rearward side of the rearward side of the frame;
e. a plurality of adjustable stretching means depending from opposing portions of said rigid member and said supporting means;
f. said adjustable stretching means being disposable at a plurality of predetermined locations on said rigid plate and said supporting means.

4,006,772

METHOD AND APPARATUS FOR CASTING STEEL INTO A CONTINUOUS CASTING MOLD

Peter J. Koenig, Zumikon, Switzerland, assignor to Concast AG, Zurich, Switzerland

Filed June 17, 1974, Ser. No. 480,060
Claims priority, application Switzerland, June 22, 1973, 9161/73
The portion of the term of this patent subsequent to Aug. 12, 1992, has been disclaimed.
Int. Cl.² B22D *11/10*
U.S. Cl. 164—66 12 Claims



1. A method of pouring molten metal, especially steel, into a continuous casting mold of a curved casting installation having an inner radius comprising the steps of conducting the steel by means of a pouring tube to a location beneath the level of the liquid metal pool in the mold, admixing with the steel at a time prior to its departure out of the pouring tube an inert gas while forming small gas bubbles, introducing the resultant steel-gas mixture into the mold in the form of a thin, coherent pattern of substantially constant width which is simultaneously directed both downwardly and laterally into the liquid metal pool in the mold and directing the pattern of the steel-gas mixture during its outflow into the liquid metal pool so as to be located in a plane which is inclined at an angle with respect to a vertical plane and which inclined pattern is directed towards the inner radius of the curved casting installation.

6. The apparatus as defined in claim 4, wherein said predetermined angle is in the order of between about 4° and 6°.

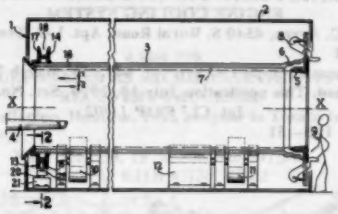
4,006,773

CENTRIFUGALLY CASTING MACHINE HAVING AN AXIAL SUPPORT DEVICE

Francois Zusatz, Pont-a-Mousson, France, assignor to Pont-A-Mousson S.A., Nancy, France

Filed May 3, 1976, Ser. No. 682,536
Claims priority, application France, June 18, 1975, 75.19037
Int. Cl.² B22D *13/02*
U.S. Cl. 164—298 3 Claims

1. A machine, in particular for centrifugal casting comprising a fixed frame, a case of revolution mounted relative to the frame to be rotatable about the axis of the case, an axial device operative in either direction for axially supporting the case and comprising a ring contained in a plane perpendicular to said axis and integral with the case, a journal which is integral with the frame and has an axis disposed radially with respect to the case in the normal position of the mean plane of the ring, a lever mounted on the journal and having an axis perpendicular to the journal and freely rotatable relative to



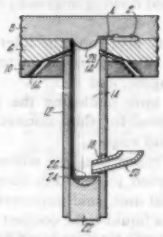
the journal, two support rollers having axes of rotation contained in a plane containing the axis of the journal and the axis of the lever and mounted to be freely rotatable on the lever, the ring defining two main annular non-axially extending bearing surfaces between which surfaces the rollers are located, the distance between the bearing surfaces in the axial direction allowing an angular movement of the lever.

4,006,774

DIE CASTING APPARATUS WHICH ELIMINATES SHOT SLEEVE-METAL CONTACT

Walter Edward Mikulski, Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed May 19, 1976, Ser. No. 687,772
Int. Cl.² B22D *17/08*
U.S. Cl. 164—312 8 Claims



1. In a casting machine for the production of cast articles wherein first and second die halves cooperate to define a die cavity in the shape of the article to be cast and a narrow runner opening into said cavity, the improvement which comprises, in combination:
a. a shot sleeve having an upwardly oriented injection chamber extending therethrough, the shot sleeve being connected to one of said die halves such that a portion of said shot sleeve defining a top end of the injection chamber is in communication with the runner opening into the die cavity, the shot sleeve having access means in a portion of said shot sleeve defining a lower end of the injection chamber through which casting material, such as a molten metal charge, is introduced;
b. a plunger disposed for reciprocating motion in the injection chamber, the upper face of the plunger including a concavity for receiving at least sufficient casting material to form the article and for carrying the casting material out of contact of the shot sleeve when the plunger is advanced upwardly in the injection chamber;
c. at least one die half which further defines a convexity

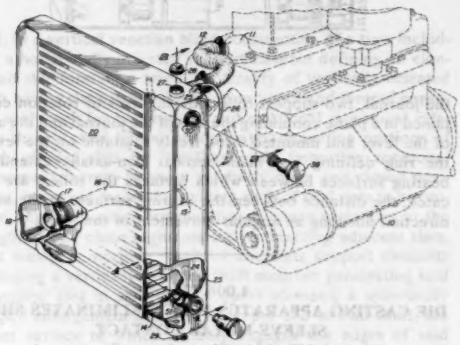
projecting into the top of the injection chamber, the convexity being suitably positioned and shaped to cooperatively mate with the concavity in the upper face of the plunger and displace casting material therefrom, through the runner and into the die cavity when the plunger is advanced to the top of the chamber.

4,006,775

AUTOMATIC POSITIVE ANTI-AERATION SYSTEM FOR ENGINE COOLING SYSTEM

Walter C. Avrea, 4540 S. Rural Road, Apt. L-7, Tempe, Ariz. 85282

Continuation-in-part of Ser. No. 449,025, March 7, 1974, abandoned. This application July 18, 1974, Ser. No. 489,584
Int. Cl.² F01P *11/02*
U.S. Cl. 165—51 1 Claim



1. For use in combination with a cooling radiator for a liquid-cooled internal combustion engine, said radiator comprising

core means providing indirect heat exchange between engine coolant liquid flowing internally therethrough and an external cooling fluid,

an inlet header tank enclosing the inlet of said core means and adapted for fluid connection to the coolant liquid outlet of said engine, and

an outlet header tank enclosing the outlet of said core means and adapted for fluid connection to the coolant liquid inlet of said engine,

the improvemenets comprising an automatic, positive anti-aeration system adapted to function cooperatively with said radiator as an integral unit, said improvements comprising:

a. means defining a liquid-tight coolant liquid accumulator;

b. means defining an inlet port in said accumulator;

c. first passage means providing a first separate path of fluid communication between said accumulator inlet port and the upper portion of a first one of said header tanks;

d. normally closed first valve means for closing said first passage means, adapted to open when the pressure in said first header tank reaches at least a first predetermined pressure higher than ambient atmospheric pressure, allowing coolant liquid and gases trapped in the upper portion of said first header tank to flow into said accumulator;

e. means for venting gases entering said accumulator to the atmosphere;

f. means defining an outlet port in the lower portion of said accumulator;

g. second passage means separate from said first passage means providing a second separate path of fluid communication between said accumulator outlet port and the lower portion of one of said header tanks;

h. second valve means for closing said second passage means, adapted to open when the pressure in said radiator falls at least below a second predetermined pressure lower than said first predetermined pressure, allowing coolant fluid in said accumulator to flow into said radiator; and

i. means for introducing an initial quantity of make-up coolant liquid into said accumulator,

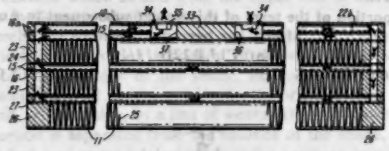
said accumulator being shaped and dimensioned to receive an initial quantity of coolant liquid, the surface level of which is above said outlet port, and to receive and temporarily store at least the volume of coolant liquid which flows through said accumulator inlet port when the pressure in said first header reaches said first predetermined pressure.

4,006,776

PLATE TYPE HEAT EXCHANGER

Robert R. Pfouts, Dayton; Anson S. Coolidge, and Daryl D. Peter, both of Findlay, all of Ohio, assignors to United Aircraft Products, Inc., Dayton, Ohio

Filed Mar. 31, 1975, Ser. No. 563,860
Int. Cl.² F28F *3/08*
U.S. Cl. 165—166 9 Claims



1. An all brazed heat exchanger, including:

a. upper and lower core sheets, one of which has side by side inlet and outlet openings for a first fluid,

b. a plurality of tube sheets positioning between said core sheets in a separated spaced relation to said core sheets and to one another,

c. at least certain of said core sheets having end apertures within the margins thereof,

d. a frame member of continuous peripheral configuration positioned between tube sheets of at least one adjacent pair and indented at its ends within its margins to form end apertures registering with the end apertures in overlying and underlying tube sheets;

e. first corrugated fin material having its corrugations extending longitudinally within said frame member between shoulders as defined by end indentations therein and confined at its sides by peripheral side portions of said frame member,

f. said first fin material cooperating with said frame member to define flow passage means for said first fluid,

g. end nose pieces positioned to space said pair of tube sheets from an adjacent tube sheet,

h. said nose pieces each having a through aperture registering with apertures in said tube sheets and in said frame member,

i. second corrugated fin material having its corrugations transverse to said first fin material confined between said nose pieces and positioning between said pair of tube sheets and said adjacent tube sheet,

j. said second fin material cooperating with said nose pieces and with tube sheets between which it is positioned to define flow passage means for a second fluid,

k. and separator means between said one core sheet and the next adjacent tube sheet positioned to lie intermediately of said inlet and outlet openings,

l. said first fluid flowing in said inlet opening to an end aperture in said next adjacent tube sheet, through an aperture in a respective one of said nose pieces and to flow passage means as defined by said first fin material and across the heat exchanger for similarly confined reverse return flow to said outlet opening,

m. the defined parts being brazed into a unitary structure with peaks and valleys of said fin material in a contacting connecting relation to adjacent tube sheets with said

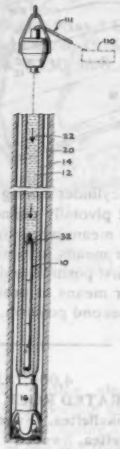
separator means in a connecting relation to said one core sheet and said next adjacent tube sheet.

4,006,777

FREE FLOATING CARRIER FOR DEEP WELL INSTRUMENTS

Leo C. LaBauve, 1506 Center St., New Iberia, La. 70560

Filed Feb. 6, 1976, Ser. No. 655,687
Int. Cl.² E21B *47/00*
U.S. Cl. 166—250 **13 Claims**



1. Apparatus for conveying deep well instruments into and out of a well bore, comprising:

means for maintaining a column of fluid extending downwardly in the well bore to a region at which a test is to be made;

means operable to controllably produce a flow of fluid downwardly through said column to said region and to halt said flow as desired; and

a carrier in said fluid column for holding an instrument or instruments adapted to test and/or obtain test records of said region, said carrier and its contents being movable downwardly by the flow of fluid in said column to said region and being sufficiently buoyant to float to the surface in said fluid column when fluid flow downwardly therethrough ceases.

12. The method of testing a subsurface region in a well containing a column of fluid, said method comprising:

introducing into the fluid column a test unit having an effective overall density to be buoyant in said fluid;

producing a flow of fluid downwardly in the well at a velocity conveying said test unit downwardly with the fluid to said region;

conducting a test by said unit while the unit is at said region; and

allowing said unit to float upwardly by its buoyancy through said fluid column and to the surface of the earth.

4,006,778

THERMAL RECOVERY OF HYDROCARBON FROM TAR SANDS

David A. Redford, Fort Saskatchewan, and Stephen M. Creighton, Edmonton, both of Canada, assignors to Texaco Exploration Canada Ltd., Calgary, Canada

Filed June 21, 1974, Ser. No. 481,581
Int. Cl.² E21B *43/24*
U.S. Cl. 166—261 **8 Claims**

1. A method for the recovery of hydrocarbons from subterranean hydrocarbon-bearing formations traversed by at least one injection well and at least one production well, and having fluid communication therebetween, comprising the steps of:

a. injecting via said injection well a mixture of steam having a quality of not more than 100 percent and an oxygen-containing gas, said mixture being injected at a temperature corresponding to the saturation temperature for saturated steam at the pressure of said formation,

b. thereafter producing said hydrocarbons from said production well.

4,006,779

LIGNOSULFONATES AS SACRIFICIAL AGENTS IN OIL RECOVERY PROCESSES

George Kalfoglou, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed June 30, 1975, Ser. No. 591,574
Int. Cl.² E21B *43/20, 43/22*
U.S. Cl. 166—275 **9 Claims**

9. In a method for recovering oil from a subterranean formation containing oil and having an injection well and a production well wherein a micellar dispersion is injected into the injection well in order to drive the oil to the production well wherein it is produced the improvement which comprises:

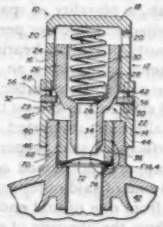
injecting into the injection well in admixture with the micellar dispersion lignosulfonates.

4,006,780

RUPTURING HEAD FOR FIRE EXTINGUISHERS

William J. Zehr, Des Plaines, Ill., assignor to The Protectoseal Company, Bensenville, Ill.

Filed May 24, 1976, Ser. No. 689,098
Int. Cl.² A62C *35/02*; F16K *13/04*; A62C *37/30*
U.S. Cl. 169—26 **4 Claims**



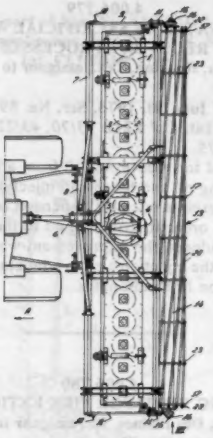
1. A head for rupturing a disk in the cylindrical neck of a container for emission of fire extinguishing material, said neck having male threads around the exterior wall of the neck and a rupturable disk in said neck, in combination with a hollow housing having a top and side wall, the upper portion being cylindrical, and having an integrally formed substantially square in cross-section lower portion, said lower portion having a top and side and end walls, the lower end of said lower portion being internally threaded for securement to the neck of the container, said lower portion provided with a pair of opposed slots in said side walls and partially into said end walls, a pair of vertically disposed roll pins anchored to said side walls and each spanning one of said slots, a hollow punch having a cylindrical spring loaded seat positioned interiorally in the upper portion of said housing and a hollow tubular member integrally formed on the lower end of said seat and offset from said seat, the free end of said tubular member being sharpened to form a cutting edge, a pair of arms each positioned in one of said slots, one end of each of said arms pivotally secured to one of said roll pins, a hooked portion on the opposite end of each of said arms and a fusible link secured to said hooked portions to position said arms in parallel and support said seat in inoperative position.

4,006,781

ROTARY SOIL-ENGAGING MEMBERS

Ary van der Lely, 10, Weverskade, Maasland, and Cornelis Johannes Gerardus Bom, 36, Esdoornlaan, Rozenburg, both of Netherlands

Filed July 17, 1973, Ser. No. 380,114
Claims priority, application Netherlands, July 18, 1972, 7209885
Int. Cl.² A01B 21/00
U.S. Cl. 172—532 13 Claims



1. An elongated roller member comprising a substantially central and horizontal axle portion, said axle portion having ends for rotatably supporting said roller member, a plurality of supports mounted along the length of said axle portion at spaced apart intervals, a plurality of spaced apart elongated elements mounted adjacent the outer peripheries of said supports and said supports providing bearing surfaces for said elements, said elements comprising an outer soil engaging peripheral surface for said roller member, retaining means for securing each of said elements in at least two alternate longitudinal settings with alternate supported regions cooperating with the bearing surfaces of said supports, said supports including two outer supports positioned adjacent said ends of the axle portion and one of said outer supports being located a different distance from one of said ends than the second of said outer supports from the opposite of said ends, said retaining means cooperating with said outer supports to retain said elongated elements in each of said alternate longitudinal settings.

4,006,782

TWO-WAY BULLDOZER MECHANISM

Shigeru Nishino, and Tomio Uchida, both of Sagamihara, Japan, assignors to Caterpillar Mitsubishi Ltd., Tokyo, Japan

Filed Mar. 1, 1976, Ser. No. 662,487
Claims priority, application Japan, Apr. 4, 1975, 50-40442
Int. Cl.² E02F 3/76
U.S. Cl. 172—806 9 Claims

1. A two-way bulldozer mechanism comprising:

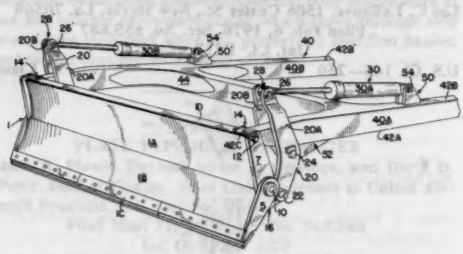
a pair of elongated push arms with each push arm having a forward tip portion provided thereon;

an upper blade having an upper edge pivotally connected to the forward tip portions of the push arms for pivotal movement thereabout;

a lower blade hingedly connected to a lower edge of the upper blade for limited relative rotational movement to permit the attitude of the upper and lower blades to be adjusted from a first position suitable for forward bulldozing to a second position suitable for reverse bulldozing;

a pair of lever means individually pivotally connected at their intermediate portions to the push arms, each of said lever means having its lower end pivotally connected to the lower blade, the lever means cooperating with the upper blade for controlling the attitude of the blades; and

a pair of hydraulic cylinders mounted on the push arms,



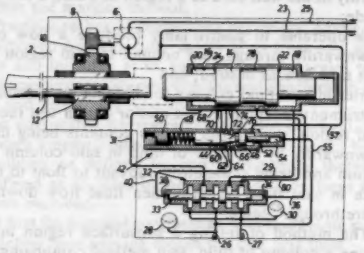
each hydraulic cylinder having an extensible and retractable piston rod pivotally connected to an upper end of one of the lever means whereby extending the piston rods pivots the lever means to position the lower and upper blades in said first position and retracting the piston rods pivots the lever means to position the lower and upper blades in said second position.

4,006,783

HYDRAULIC OPERATED ROCK DRILLING APPARATUS

Sven Granholm, Skelleftea, Sweden, assignor to Linden-Alimak AB, Skelleftea, Sweden

Filed Mar. 17, 1975, Ser. No. 558,688
Int. Cl.² E21C 3/20
U.S. Cl. 173—12 18 Claims



1. A rock drilling apparatus, comprising a machine housing, means for mounting a drill in said housing, a hydraulically operated rotary motor for rotating said drill, a percussion motor with an impact piston hydraulically operable to perform a power stroke to and a return stroke from said drill for transferring impact energy thereto, said piston defining together with said machine housing first and second pressure chambers for receiving pressure liquid to move said piston to and from the drill, respectively, said percussion motor having a hydraulic circuit including a high pressure side and a low pressure side, a pressure liquid distributing valve having a control input for receiving a control pressure, said distributing valve being located in said hydraulic circuit of the percussion motor for alternately connecting at least one of said pressure chambers to the high pressure side and low pressure side, respectively, of said hydraulic circuit in response to said control pressure, said rotary motor having a hydraulic circuit separate from said hydraulic circuit of the percussion motor and including a high pressure side and a low pressure side separate from the high and low pressure sides of the percussion motor, and a control valve for controlling said control pressure in response to the pressure at the high pressure side of said rotary motor, the

control valve being responsive to the pressures at the high pressure sides of both hydraulic circuits to open and close a control pressure supply line to said control input of said distributing valve for controlling the connection of the high pressure side of the hydraulic circuit of the percussion motor to said first chamber, via said distributing valve.

4,006,784

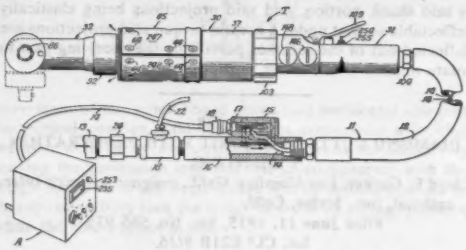
FLUID OPERATED POWER TOOL

Edmund C. Dudek, St. Charles, Ill., assignor to Thor Power Tool Company, Aurora, Ill.

Division of Ser. No. 359,640, May 14, 1973, Pat. No. 3,920,082. This application Oct. 6, 1975, Ser. No. 620,018

Int. Cl.² B23Q *5/06*

U.S. Cl. 173—12 **3 Claims**



1. An arrangement for routing electrical conductors through the interior of the body portion and hollow handle of a power tool, said body portion including an elongated tubular housing having said handle at one end thereof and adapted to receive a torque output attachment at the opposite end thereof, a motor having a generally cylindrical casing mounted in said housing, bearing support plates at each end of said motor casing and engaging the inner surface of said housing, a reduction gear case member for supporting reduction gearing in said housing, said reduction gear case member engaging the inner surface of said housing and disposed between one of said motor casing bearing support plates and the torque output end of said housing, and another gear case member at the torque output end of said housing, said other gear gase member including a cylindrical transducer, said routing arrangement comprising an annular clearance between said other gear case member and the inner surface of said housing, at least one axially extending groove in the outer surface of said reduction gear case member, an axial bore in said one motor bearing support plate, and an axial bore in said motor casing having one end registering with the bore in said last mentioned motor bearing support plate and its other registering with an axial bore in the bearing support plate adjacent to said handle, said bore in said bearing support plate adjacent to said handle communicating with the hollow interior of said handle.

4,006,785

POWER TOOL

Karl Roll, Leinfelden, and Klaus-Peter Fritschi, Merklingen, both of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

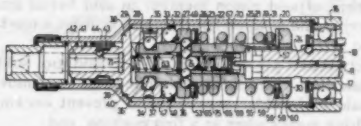
Filed Nov. 12, 1975, Ser. No. 631,187

Claims priority, application Germany, Dec. 19, 1974, 2460072

Int. Cl.² B25B *23/14*

U.S. Cl. 173—12 **10 Claims**

1. A power tool, particularly a hand-held pneumatically driven power screwdriver or other hand-held power tool, comprising, in combination, a tool housing, a drive motor in the housing, a spring-loaded release valve device arranged in an energy supply conduit leading to the motor for blocking and unblocking the energy supply conduit, a tool holder rotatably mounted at the front of the housing, a clutch including a hollow driving part connected to the motor and a driven part connected to the tool holder, the clutch being axially shiftable together with the tool holder, the driven part having a plurality of clutch depressions bounded by sloping clutch ridges, the clutch including clutch elements located in the clutch depressions, the clutch including an axially shiftable pressure body surrounding the driving part, adjustable-stress first spring means causing the pressure body to urge the clutch elements to the bottoms of the clutch depressions, the driving and driven parts being immovable relative to each other in axial direction, the driving and driven parts becoming rotatable relative to each other when the torque transmitted by the clutch reaches a predetermined value causing the clutch elements to climb up the associated sloping clutch riges and out of the clutch depressions, the clutch further including a locking bolt guided in the interior of the driving part for axial movement relative to the driving part and being coupled to transmit force to the release valve when axially moved, the locking bolt being guided in the driving part non-rotatable relative to the latter and having at least one radial bore, the driving part having at least one radial bore which can be



brought into register with the radial bore of the locking bolt, the clutch further including at least one outer and one inner radially shiftable locking element in the radial bores the inner one of which serves when the bores are in register for locking the driving part and the locking bolt together for joint axial movement so that axial movement of the clutch in response to axial movement of the tool holder causes the locking bolt to transmit force from the driving part to the spring loaded release valve device, the pressure body having a cam surface which faces towards the driving part, the clutch further including second spring means operative for causing the inner locking element to urge the outer locking element radially outward into abutment against the cam surface, the cam surface being so configurated that when the clutch elements climb out of the clutch recesses and push back the pressure body against the opposition of the first spring means the cam surface of the pressure body drives the locking elements radially inward to a position in which the locking elements no longer lock the driving part and locking bolt together for joint axial movement, whereby the locking bolt can no longer transmit axial force from the clutch to the release valve.

4,006,786

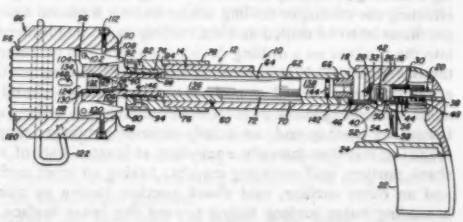
POWER ACTUATED PORTABLE MARKING TOOL

Edwin W. Speicher, Pittsburgh, Pa., assignor to M. E. Cunningham Company, Ingomar, Pa.

Filed July 22, 1975, Ser. No. 598,116

Int. Cl.² B44B *5/00*

U.S. Cl. 173—15 **10 Claims**



1. A power actuated marking tool comprising,

a longitudinal housing having a forward end portion and a

rearward end portion, said longitudinal housing having a bore therethrough,

a barrel assembly positioned within said housing bore for relative movement therein, said barrel assembly having a bore coaxially aligned with said housing bore,

said barrel assembly having a cartridge receiving chamber positioned within said housing rearward end portion,

a tool holder secured to said barrel assembly adjacent said forward end portion of said housing, said tool holder having a bore therethrough coaxially aligned with said barrel assembly bore,

tool support means positioned for reciprocal movement within said tool holder bore for retaining marking elements in said tool holder,

said tool support means having an anvil end portion axially positioned within said tool holder bore,

a piston member positioned for reciprocal movement within said aligned barrel and tool holder bores and arranged to abut the forward end portion of said cartridge receiving chamber,

firing means positioned in said housing rearward of said cartridge receiving chamber for actuating forward movement of said piston member in said barrel assembly to strike said anvil end portion and transfer a marking force to said tool support means,

safety means pivotally connected to said tool holder within said bore thereof for restraining rearward movement of said tool holder and barrel to prevent cocking of said firing means when in a first position, and

said safety means operable to assume a second position relative to said tool holder to permit rearward movement of said tool holder and barrel to permit cocking of said firing means.

4,006,787

DRILLING TOOL WITH DRILL AND RECEIVING ELEMENT

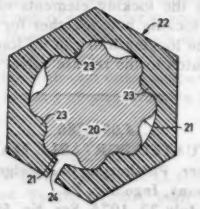
Gerhard Rumpp, Inning; Karl-Heinz Gärtner, Munich, and Wilm Krüger, Puchheim, all of Germany, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Aug. 28, 1975, Ser. No. 608,688

Claims priority, application Germany, Sept. 19, 1974, 2444899

Int. Cl.² B25D *17/02*; E21C *13/06*

U.S. Cl. 173—132 **12 Claims**



1. A drilling tool comprising an axially elongated drill having a leading or cutting end and a trailing end, the leading end effecting the cutting or drilling action when it is placed against the material to be drilled and the trailing end being insertable into the retainer on a drilling device such as a drill hammer or the like, said drill having an axially extending cutting portion extending from its leading end toward its trailing end and an axially extending shank portion extending from its trailing end toward its leading end, an axially extending tubular shaped receiving member laterally encircling at least a part of said shank portion, said receiving member having an inner surface and an outer surface, said shank portion having an axially extending outer surface facing toward the inner surface on said receiving part, wherein the improvement comprises that the trailing end of said shank portion projects outwardly from the trailing end of said receiving member, a first axially extending part of the inner surface of said receiving part and a first axially extending part of the outer surface of said shank portion are disposed in engagement and a second axially extending part of the inner surface of said receiving part and a second axially extending part of the outer surface of said shank portion are disposed in spaced relation forming therebetween at least one axially extending passageway opening between the trailing end of said shank portion and the trailing end of said cutting portion, at least one of the first part of the inner surface of said receiving part and the first part of the outer surface of said shank portion comprises a projection extending into contact with the first part of the surface it faces and the first part of the surface it faces having a recess into which the projection seats, a plurality of said projections form the first part of the inner surface of said receiving port with said projections disposed in spaced relation and extending radially relative to the axis of said shank portion into recesses in said shank portion, and said projections being elastically deflectable so that under a certain torque said projections are deflected out of the recesses permitting the receiving part to rotate relative to the shank portion.

4,006,788

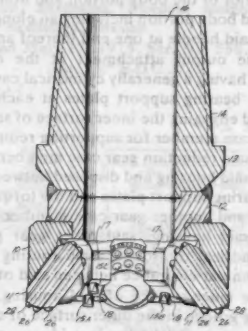
DIAMOND CUTTER ROCK BIT WITH PENETRATION LIMITING

Lloyd L. Garner, Los Alamitos, Calif., assignor to Smith International, Inc., Irvine, Calif.

Filed June 11, 1975, Ser. No. 585,975

Int. Cl.² E21B *9/36*

U.S. Cl. 175—330 **41 Claims**



11. A rotary rock bit comprising:

a bit body;

a plurality of diamond cutters on the bit body each with a cutting edge extending from the bit body a selected distance for engaging the bottom of a hole being drilled at a selected rake angle and shearing rock during drilling; and

means on the rock bit for engaging the rock being drilled and limiting depth of penetration of the diamond cutters into rock during drilling to a depth of more than about one-fourth and less than about three fourths of the length of the diamond cutters extending from the body.

4,006,789

SCALE FOR WEIGHING HOSPITAL PATIENTS IN THEIR HORIZONTAL POSITION

Frederick L. Stultz, Concord, and George C. Clark, Oakland, both of Calif., assignors to Acme Scale Company, Oakland, Calif.

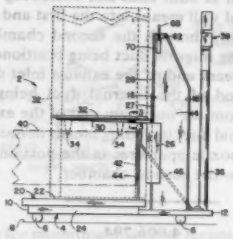
Filed Jan. 21, 1976, Ser. No. 650,823

Int. Cl.³ G01G *21/00*, *19/00*, *21/22*

U.S. Cl. 177—126 **17 Claims**

1. A scale for weighing a patient in the horizontal position comprising: a support frame; a weighing mechanism carried by the support frame including a generally horizontally pro-

truding member connected to the weighing mechanism; a weigh-board; means connecting the weigh-board to the horizontal member for pivotal movement of the board about a horizontal axis between a first, horizontal position and a second, vertical storage position; means for retaining the weigh-board in the vertical position including stop means positioned to engage a portion of the weigh-board for preventing pivotal



movement of the weigh-board about said horizontal axis past its vertical position, said stop means comprising a locking member defined by a protrusion and means for selectively moving the protrusion into and out of engagement with the weigh-board when the weigh-board is in its vertical position to thereby selectively lock the weigh-board in its storage position while the board is not in use.

4,006,790

ELECTROMAGNETIC GUIDANCE SYSTEM

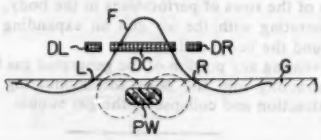
Shigeyoshi Kawano, Hitachiota; Hisao Hanmura, and Masayoshi Sunada, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 8, 1975, Ser. No. 539,424

Claims priority, application Japan, Jan. 11, 1974, 49-5979; July 8, 1974, 49-77271

Int. Cl.² B60K *27/06*

U.S. Cl. 180—98 **10 Claims**



1. An electromagnetic guidance system comprising two conductors disposed parallel and closely adjacent to each other and laid down in a predetermined pattern; means for connecting the two conductors in series with each other; means for supplying current for the conductors; and means for detecting magnetic field induced by the current, wherein a desired apparatus is controlled to be guided along the conductors according to the output of the detecting means, and wherein the two conductors are vertically parallel to each other.

4,006,791

DEVICE FOR REGULATING THE TRAVELING SPEED OF A MOTOR VEHICLE

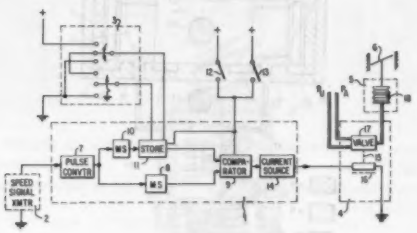
Joachim Feldmann, Helstorf; Arnold Mann, Bieber, and Ludolf Heimbach, Frankfurt, all of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Germany

Filed Nov. 4, 1974, Ser. No. 520,782

Claims priority, application Germany, Nov. 9, 1973, 2356012

Int. Cl.² B60K *31/00*

U.S. Cl. 180—108 **9 Claims**



1. In a device for regulating the traveling speed of a motor vehicle, comprising:

A. an electric regulator means acted upon by a speed-responsive signal for comparing the prevailing traveling speed with a prespecified desired traveling speed and, in the case of a deviation of the actual traveling speed from the prespecified one, for emitting an error signal proportional to the deviation variable,

B. a pneumatic adjusting drive means for acting upon an element affecting the ratio between fuel and air in the fuel-air mixture fed to the motor vehicle engine, and

C. a control stage means controlled by a signal emitted by the regulator means for controlling the drive means by means of air pressure,

the improvement wherein the control stage means comprises:

D. a first source of air at a first pressure,

E. a second source of air at a second pressure,

F. a chamber of selectively variable air pressure pneumatically connected to operate the adjusting drive,

G. a first valve seat in fixed interposition between the first source of air and the chamber,

H. a second valve seat situated between the second source of air and the chamber and arranged to be displacable from or toward the first valve seat,

I. first and second valve plug means for respectively checking air flow past the first and second valve seats, said valve plug means being rigidly connected to one another, and

J. electromagnetic means responsive to the error signal for moving the second valve seat in either of two directions from an equilibrium position for unseating only the first valve plug when moving in one direction, for unseating only the second valve plug when moving in the other direction, and for unseating neither valve plug when in the equilibrium position,

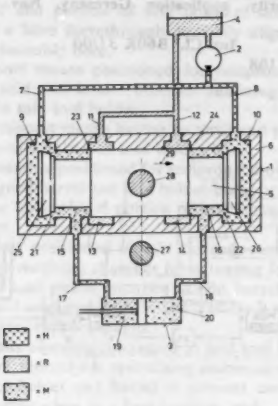
whereby air flow past the valve seats when needed to change the pressure of the chamber, but substantially no air flows past the valve seats when the pressure of the chamber is correct.

4,006,792

STEERING SYSTEM WITH AUXILIARY POWER ASSIST

Albert Bundschuh, Waldstetten, Germany, assignor to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Germany

Filed Oct. 29, 1975, Ser. No. 626,771
Int. Cl.² B62D 5/08
U.S. Cl. 180—143 5 Claims



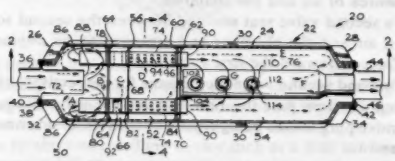
1. In combination with a vehicle steering system having an engine driven servo pump (2 or 102) supplying fluid at a flow rate that is an inverse function of engine speed above a predetermined value, at least one control valve (5 or 105) through which the fluid is supplied to a servo motor (3), a torsion spring connected to the control valve for resisting displacement thereof with an increasing bias (27 or 127) and means (28) to which a manual effort is applied for displacing the control valve against the bias of said torsion spring, the improvement including flow regulating surface means (25, 26, or 125, 126) formed on the control valve for varying the output flow rate to the servo motor as a function of displacement of the control valve, whereby the manual effort required to meet increasing steering resistance at engine speeds above said predetermined value increases more rapidly than the increase in the steering effort at engine speeds below said predetermined value.

4,006,793

ENGINE MUFFLER APPARATUS PROVIDING ACOUSTIC SILENCER

Joseph D. Robinson, 1209 159th St., Gardena, Calif. 90247

Filed Nov. 14, 1975, Ser. No. 631,866
Int. Cl.² F01N 1/08
U.S. Cl. 181—53 28 Claims



1. An exhaust muffler apparatus for internal combustion engines and the like, which comprises:

a. an elongate, tubular housing having a central portion and upstream and downstream end portions,

b. first and second transverse wall means for internally dividing the housing longitudinally into a first upstream chamber, a second central chamber and a third downstream chamber;

c. an exhaust inlet duct extending through the upstream housing end portion into the first chamber, the duct having open upstream and downstream end portions.

d. an exhaust outlet duct extending through the downstream end portion into the third chamber, the outlet duct having an open downstream end portion and having at leasst one inlet opening formed in an upstream portion thereof disposed in the third chamber; and

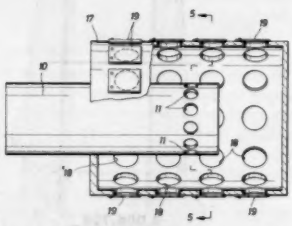
e. at least one elongate, internal duct longitudinally disposed within the housing, the internal duct being laterally displaced out of alignment with the inlet and outlet ducts and being open at both ends and extending through the first and second wall means into the first and third chambers and entirely through the second chamber, the upsteam end of the internal duct being positioned upstream of the downstream end of the exhaust inlet duct and the downstream end of the internal duct being positioned downstream from the upstream end of the exhaust outlet duct, the internal duct including means defining a number of expansion nozzle apertures in the portion of the duct disposed within the second chamber.

4,006,794

SEISMIC PNEUMATIC ENERGY SOURCE WITH FLAP VALVES FOR ATTENUATION OF BUBBLE PULSE AMPLITUDE AND REDUCTION OF PERIOD OF BUBBLE OSCILLATION

Oswald Alfonso Itria, Bellaire, Tex., assignor to Texaco Inc., New York, N.Y.

Division of Ser. No. 411,986, Nov. 1, 1973, Pat. No. 3,923,122, which is a continuation of Ser. No. 220,940, Jan. 26, 1972, abandoned. This application Aug. 25, 1975, Ser. No. 607,307
Int. Cl.² G01V 1/38
U.S. Cl. 181—115 14 Claims



1. A method for attenuating the amplitude and reducing the period of bubble pulses resulting from a primary seismic energy pulse generated by a rapid expansion of gases underwater from an air gun having a single row of perforations thereabout mounted inside of a body having a multiplicity of rows of perforations therein comprises the steps of,

a. aligning the air gun single row of perforations between two of the rows of perforations in the body,

b. generating with the air gun an expanding gas bubble around the body, and

c. preventing any portion of the generated gas bubble from contracting into the body for attenuating the sudden contraction and collapse of the gas bubble.

4,006,795

MEANS FOR SEISMIC PROSPECTING FROM BULK LIQUID CARRIERS

Nigel A. Anstey, Sevenoaks, England, assignor to Seiscom Delta Inc.

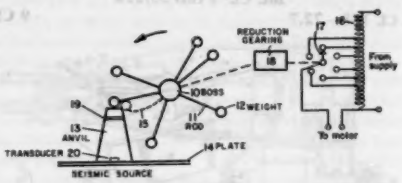
Filed Apr. 27, 1972, Ser. No. 248,023
Claims priority, application United Kingdom, Apr. 28, 1971, 11952/71
Int. Cl.² G01V 1/14
U.S. Cl. 181—121 2 Claims

1. A seismic system for exploration of geological features beneath a body of water from a bulk liquid carrier having liquid containing cargo tanks comprising:

a. weight means for forming the seismic signal upon impact with another body;

b. anvil means mounted in a cargo tank of the ship for receiving the impact of said weight means to form the seismic signal;

c. boss means for causing said weight means to strike said anvil means in a sequence of repetitive impacts in a periodic cycle;



d. means for mounting said anvil means with the ship so that the impact of said weight means on said anvil means is transmitted into the body of water;

e. means for increasing the period of repetitive impacts in the periodic cycle; and

f. array means mounted in a cargo tank of the ship for sensing a seismic reflection signal returned from the geological strata.

4,006,796

EARPIECE WHICH SUBSTANTIALLY CONSISTS OF A THIN-WALLED FLEXIBLE CAPSULE FILLED WITH A LIQUID MEDIUM

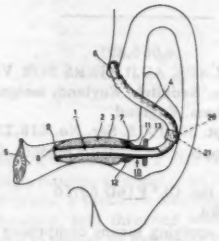
Robert Francois Coehorst, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 529,339, Dec. 4, 1974, abandoned. This application Dec. 16, 1974, Ser. No. 533,245

Claims priority, application Netherlands, Dec. 21, 1973, 7317546; Dec. 4, 1974, 7415788

Int. Cl.² H04R *25/02*; A61B *7/02*

U.S. Cl. 181—130 **17 Claims**



1. An earpiece comprising, an oblong thin-walled flexible container made of a plastic foil filled with a jelly-like paste material and having an acoustic duct extending therethrough in the longitudinal direction, and a flexible plastic tube which is less pliant than the plastic foil container and is located in the acoustic duct and is adapted for acoustically coupling the duct to a hearing aid, said container being disposed around and at one end of the plastic tube.

4,006,797

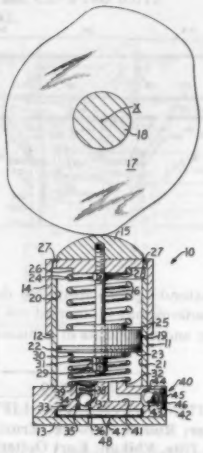
CAM ACTUATED LUBRICATION PUMP

Frank E. Keske, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed May 15, 1975, Ser. No. 577,810

Int. Cl.² F16N *13/10*

U.S. Cl. 184—27 R **9 Claims**



1. A pump adapted for use in a lubrication system comprising

a housing,

a cup-shaped member reciprocally mounted on a first end of said housing,

a rod fixedly secured to said member and disposed internally thereof,

a piston reciprocally mounted on said rod to define a pair of isolated and expansible first and second chambers on either side thereof,

first compression spring means disposed in said first chamber between said piston and said member and second compression spring means disposed in said second chamber between said piston and said housing,

inlet means, including normally closed first valve means, for communicating fluid into said second chamber upon expansion thereof in response to reciprocal movement of said piston in a first direction and

outlet means, including normally closed second valve means, for communicating pressurized fluid from said second chamber and exteriorly of said pump upon contraction of said second chamber in response to reciprocal movement of said piston in a second direction opposite to said first direction,

said pump being operable to automatically limit fluid flow through said second valve means when the combined pressure of the fluid and the spring in said second chamber equals the compression force of the spring in said first chamber.

4,006,798

DRIVE-UP SERVICE ARRANGEMENT FOR BANKS, AND THE LIKE

Fred W. De Mund, Box 612, Morgantown, W. Va. 26505

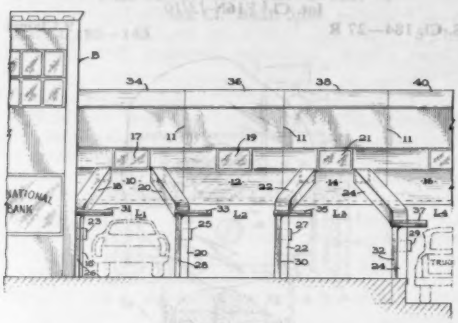
Filed Mar. 29, 1976, Ser. No. 671,714

Int. Cl.² E04H *3/04*

U.S. Cl. 186—1 C **12 Claims**

1. An extensible chain arrangement of personnel enclosures comprising a plurality of interconnected cell modules, a first module of said chain securely attachable to a building proper and including passageway therebetween, additional ones of said modules being successively and securely attached to said first module and to each other to thereby form said chain

including passageway therethrough, and means supporting said chain above ground level whereby a plurality of motor vehicle lanes are formed for passage of vehicles thereunder, with at least one of said modules being equipped with a conveyor means extending forwardly and down to ground level whereby transactions may be carried out between at least one of said modules and occupants of vehicles in separate lanes at ground level.



4,006,799

SPEED LIMITING DEVICE FOR LIFTS OR THE LIKE

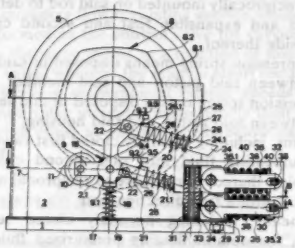
Heinrich Binder; Rudolf Glawion; Ernst Gruessy, all of Lucerne; Peter Hitz, Ebikon; Kurt Oetterli, Eschenbach; Hans Seidl, Ebikon, and Hans Stoeckli, Emmenbrucke, all of Switzerland, assignors to Inventio AG, Hergiswil, Switzerland

Filed June 20, 1975, Ser. No. 588,940

Claims priority, application Switzerland, June 24, 1974, 8610/74

Int. Cl.² B66B *5/04*

U.S. Cl. 187—38 **6 Claims**



1. A speed limiting device for lifts or the like including a lift cabin, comprising a limiter cable attachable to the lift cabin, a cable wheel drivable by means of the limiter cable, a shaft, a cam disk fixedly connected with the cable wheel and seated together with said cable wheel upon said shaft, a support which is moved by said cam disk, a separate cable brake acting upon the limiter cable, actuation means which upon activating the separate cable brake is actuated with a tilting action, said actuation means possessing at least one mass body which is accelerated substantially proportionally to the lift travel speed by the support when the cam disk rotates, said mass body upon exceeding a predetermined travel speed being movable relative to the support under the action of the inertia forces for releasing the actuation means, a bearing plate, said support comprising a single-arm lever rotatably mounted in said bearing plate, said lever being branched at one end thereof to form an upper branched portion and a lower branched portion, each branched portion being provided with an inclined portion and a notch, a roller rotatably mounted at said lever, and spring means for pressing said roller against the periphery of the cam disk.

4,006,800

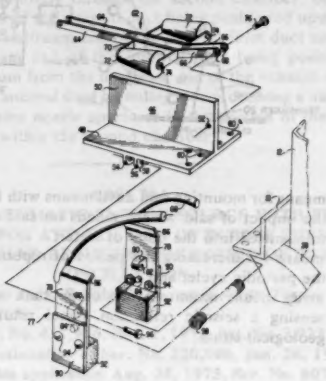
LEVER ACTUATED BRAKE ASSEMBLY

Jack Peters, 24008 Bessemer St., Woodland Hills, Calif. 91364, and DeLoris Joan Barrett, 6206 Satsuma Ave., North Hollywood, Calif. 91606

Continuation-in-part of Ser. No. 486,704, July 8, 1974, Pat. No. 3,945,472. This application Mar. 15, 1976, Ser. No. 666,542

Int. Cl.² F16D *55/228*

U.S. Cl. 188—72.7 **9 Claims**



1. A brake apparatus, comprising:

a first pivoted lever;

means for transferring force from said first pivoted lever at a steadily increasing distance from said first pivoted lever as said brake apparatus is applied;

at least one pivoted brake lever;

at least one brake shoe supported by said at least one pivoted brake lever;

means responsive to the pivoting of said first pivoted lever for applying a force from a first point which moves relative to the pivot of said first pivoted lever in a direction to increase the mechanical advantage of said first pivoted lever, to a second point which moves relative to the pivot of said at least one pivoted brake lever to concurrently increase the mechanical advantage of said at least one pivoted brake lever, whereby pivoting said first pivoted lever to apply braking force produces a continuous change in the effective length of both levers and a continuous increase in the mechanical advantage of both said first pivoted lever and said at least one pivoted brake lever.

4,006,801

AUTOMATIC SLACK ADJUSTERS FOR VEHICLES

John Patrick Bayliss, Redditch, England, assignor to Girling Limited, Birmingham, England

Filed Sept. 30, 1975, Ser. No. 618,226

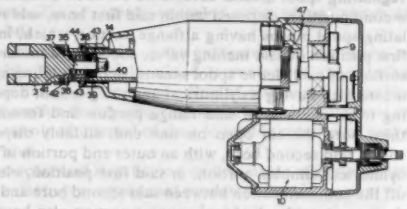
Claims priority, application United Kingdom, Oct. 16, 1974, 44743/74

Int. Cl.² F16D *65/56*

U.S. Cl. 188—196 BA **10 Claims**

1. Vehicle brake applying means comprising a load transmitting assembly for transmitting a brake applying force from an actuator to a braking mechanism, and adjuster means for increasing automatically the effective length of said load transmitting assembly to maintain braking clearances at a constant value, said load transmitting assembly incorporating first and second parts which are relatively movable in an axial direction between an advanced position in which the sum length of said parts is at a maximum value and a retracted position in which the sum length of said parts is at a minimum value shorter than the maximum value, a first pair of abutment

surfaces being in engagement in said advanced position and being spaced apart in said retracted position, and a second pair of abutment surfaces being spaced apart in said advanced position and being in engagement in said retracted position, and resilient means acts between said first and second parts normally to urge said first and second parts into said advanced position to take up slack and maintain friction pads of a braking mechanism spaced from a rotatable braking memeber by a



distance comprising said braking clearances determined by said adjuster means, said resilient means being overcome after said braking clearances have been taken up on each brake applying movement and the resistance is greater than the loading of said resilient means whereafter the sum length of said parts reduces to the said minimum value and the brake applying force is transmitted to said braking mechanism through an engagement between said second pair of abutment surfaces.

4,006,802

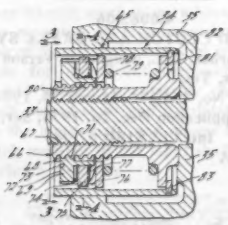
AUTOMATIC ADJUSTOR FOR A BRAKE MECHANISM

Anthony C. Evans, Westland, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.

Division of Ser. No. 446,735, Feb. 28, 1974, Pat. No. 3,934,684. This application Oct. 21, 1975, Ser. No. 624,549

Int. Cl.² F16D *65/56*

U.S. Cl. 188—196 D **5 Claims**



1. An automatic adjustor for a disk brake assembly or the like comprising a housing adapted to be received in a piston of an associated brake, a threaded member rotatably supported within said housing, said threaded member having internal threads adapted to engage an externally threaded member and external threads of a different pitch from said internal threads, a drive ring rotatably positioned within said housing and having a threaded connection with said external threads of said threaded member, means for transferring an axial force from said housing to said drive ring for differential thread rotation of said threaded member upon axial movement of said housing relative to said threaded member, and one-way brake means interposed between said drive ring and said housing for limiting the degree of reverse rotation of said threaded member upon return action of the associated brake.

4,006,803

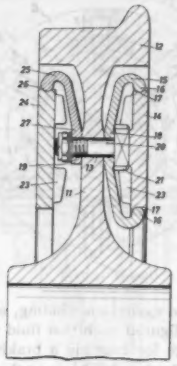
WHEEL WITH BRAKE DISCS FOR RAIL VEHICLES

Willi Klein, Remscheid; Henning Rocholl, Radevormwald; Hermann-Josef Feldhoff, and Alfred Otto, both of Remscheid, all of Germany, assignors to Bergische Stahl-Industrie, Remscheid, Germany

Filed July 11, 1975, Ser. No. 595,230

Int. Cl.² F16D *65/12*

U.S. Cl. 188—218 XL **3 Claims**



1. A rail vehicle wheel, having a radially outer rim and a central hub and also comprising wheel disc means interconnecting said hub and said rim, which includes: brake disc means having an inner and an outer circumference and arranged at least on one side of said wheel disc means, that side of said brake disc means which faces said wheel disc means being provided with radially extending cooling fins, force transmitting means interposed between said wheel disc means and said brake disc means for transmitting forces acting upon said brake disc means onto said wheel disc means, preloaded elastically deformable holding means connected to said wheel and holding under pre-load at least one of said inner and outer circumferences of said brake disc means, said holding means including clamping means positively connected to said wheel disc means, and bolt means connecting said clamping means to said wheel disc means and having a head with radial surfaces which is located betwen said clamping means and the respective adjacent brake disc means, said last mentioned disc means having that side thereof which faces the respective adjacent bolt head provided with a groove having radial and axis-parallel surfaces engaged by said radial surfaces of said bolt head.

4,006,804

ELECTROMAGNETICALLY-ACTUATABLE ROTARY VANE PUMP FOR USE AS A HYDRAULIC BRAKE

Henri Fehr, Montmorency, France, assignor to Compagnie de Construction Mechanique Sulzer, Paris, France

Filed Apr. 21, 1975, Ser. No. 569,787

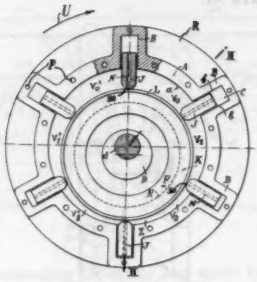
Claims priority, application France, Apr. 29, 1974, 74.14846; July 18, 1974, 74.25010

Int. Cl.² F16D *57/02, 57/06*

U.S. Cl. 188—293 **11 Claims**

1. A rotary vane pump, comprising a rotor housing filled with a braking fluid, a stator eccentrically arranged within the rotor housing, said stator possessing a constant eccentricity with respect to the rotor housing, a plurality of radially displaceable sliding vanes disposed within the rotor housing, each sliding vane having a longitudinal edge coacting with the stator, each two successive sliding vanes forming therebetween a working chamber, the braking fluid in the working chambers to each side of each sliding vane being at different pressures during operation, means for electromagnetically

actuating said sliding vanes to enable said rotary vane pump to function as a hydraulic brake, said electromagnetically actuating means comprises an excitation winding carried by said stator, the flow of an excitation current through said excitation winding producing an electromagnetic force acting upon said sliding vanes, and wherein said electromagnetic force can be adjusted by varying the current intensity of the current



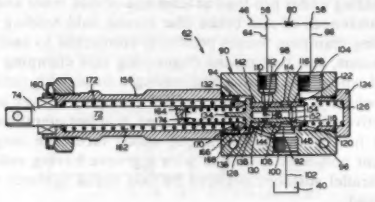
flowing-through said excitation winding, each said longitudinal edge being configured such that fluid passing thereunder forms a fluid wedge for exerting a braking effort upon the rotor housing, said fluid wedge having a thickness governed by the electromagnetic force and the pressure differential developed between two neighboring working chambers adjacent the associated sliding vane.

4,006,805

CLUTCHES WITH BYPASS INCHING VALVE

Burton S. Zeller, and Ronald L. Sisson, both of Jackson, Mich., assignors to Clark Equipment Company, Buchanan, Mich.

Filed June 30, 1975, Ser. No. 591,570
Int. Cl.² B60K *29/02*
U.S. Cl. 192—4 A **10 Claims**



1. In a hydraulic control system for a vehicle, including brake means, comprising first hydraulic passage means connecting a source of pressure fluid to fluid actuated frictional engaging means, said source being provided with pressurizing means for providing pressurized fluid in an amount proportional to the speed of the engine of said vehicle, and a bypass type inching valve system connected and parallel with said first hydraulic passage means for selectively manually reducing the hydraulic pressure supplied into said frictional engaging means in proportion to the degree of actuation of said brake means, said bypass type inching valve system including a fluid flow constricting means disposed within said first passage means and an inching valve, said inching valve comprising:

a. an elongated valve body forming a first bore therein with a closed end, said body having inlet, outlet and drain ports in said body which communicate with said first bore;

b. first conduit means connecting said inlet port with said first hydraulic passage means upstream from said fluid flow constricting means;

c. second conduit means connecting said outlet port with said first hydraulic passage means downstream from said fluid flow restricting means;

d. sleeve spool means forming a second bore therein retained within said first bore and having a first annular groove with first radial apertures aligned with said inlet port, said sleeve spool means also having a second annular groove with second radial apertures aligned with said drain port;

e. regulating spool means, actuatable between a first and a second position, disposed within said first bore, said regulating spool means having a flange portion which, in the first position of said inching valve, abuts one annular end surface of said sleeve spool means, said regulating spool means also having a cylindrical annular portion, depending from one side of said flange portion and forming a third bore therein open on one end, slidably disposed within said second bore, with an outer end portion of said cylindrical annular portion, in said first position, closing off the communication between said second bore and said drain port, said cylindrical annular portion also having a third annular groove with third radial apertures therein substantially aligned with said first radial apertures in said first position;

f. first means for biasing said regulating spool means to said first position;

g. actuating means, operatively connected with said brake means for overcoming said first biasing means and permitting said regulating spool means to move to said second position; and

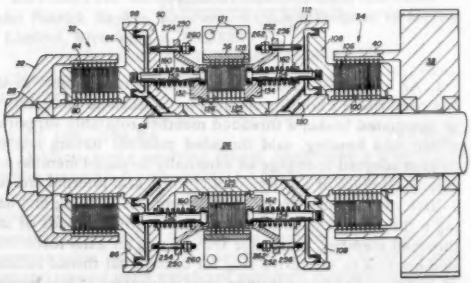
h. second means for biasing, interposed between said regulating spool means and said actuating means, tending to balance the forces exerted on said regulating spool means by the pressure fluid, said actuating means also progressively decreasing the force of said second biasing means as the degree of actuation of said brake means is increased, whereby when said regulating spool means is in said first position, the pressure fluid can freely flow into, through and out of said inching valve and effectively bypass said fluid flow contricting means, however, in said second position, the fluid flow through said third annular groove is blocked and thereafter said drain port is progressively opened thereby regulating the force of the pressure fluid acting on said regulating spool means, and the pressure fluid is forced to flow solely through said fluid flow constricting means.

4,006,806

TWO-SPEED CLUTCH AND BRAKE SYSTEM

Jene A. Beneke, Parker, Tex., assignor to Verson Allsteel Press Company, Dallas, Tex.

Division of Ser. No. 454,271, March 25, 1974, Pat. No. 3,896,911. This application Dec. 26, 1974, Ser. No. 536,547
Int. Cl.² F16D *67/04*
U.S. Cl. 192—18 A **9 Claims**



1. A clutch system comprising:

a rotatable shaft,

a low speed clutch assembly including friction clutch surfaces mounted about said shaft,

a high speed clutch assembly spaced from said low speed clutch assembly and including friction clutch surfaces mounted about said shaft,

a brake assembly disposed between said low and high speed clutch assemblies and including a plurality of friction surfaces mounted about said shaft,

a stationary housing mounted about said brake assembly, and brake friction surfaces engaging said housing to brake said shaft when said clutch assemblies are disengaged,

means for selectively engaging either of said clutch assemblies,

means for maintaining the engagement of said brake assembly for a predetermined increment of time during the initial engagement of either of said clutch assemblies,

means for disengaging said brake assembly after said predetermined interval of time to enable rotation of said shaft, and

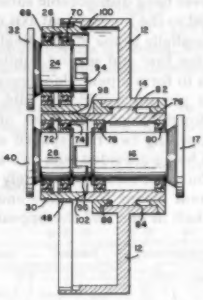
a mechanical stop having an adjustable effective length for selectively varying said predetermined increment of time.

4,006,807

POWER TRANSFER MECHANISM

Carl Franklin Back, Orrville, Ohio, assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Feb. 18, 1976, Ser. No. 659,134
Int. Cl.² F16D *21/02*, *25/10*
U.S. Cl. 192—48.9 **4 Claims**



1. In a power transfer mechanism: a housing; an output shaft support plate mounted to move translationally within the housing; a pair of output shafts mounted in said translationally movable plate for movement therewith; an input shaft mounted in said housing; a rotatable clutch member connected to each output shaft and a rotatable clutch member connected to the input shaft; and means for selectively coupling the clutch member of the input shaft with either of the output shaft clutch members.

4,006,808

CONTROLS FOR A CENTRIFUGAL FLUID CLUTCH

James G. Starling; Jay J. Wait, and Craig W. Riediger, all of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed May 27, 1975, Ser. No. 581,007
Int. Cl.² F16D *43/284*
U.S. Cl. 192—103 FA **8 Claims**

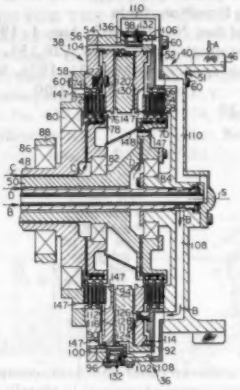
1. A control system, for a rotating clutch having a rotating housing with a cavity adapted to axially slidably receive a clutch actuating piston therein and defining a clutch actuating chamber therebetween, comprising;

a source of fluid;

a control valve for infinitely variably supplying said fluid through a path in the rotating housing to such clutch actuating chamber so that the clutch actuating piston is biased in a direction to engage the clutch;

passage means in said rotating housing including a radially disposed bore of a predetermined cross sectioned area disposed in fluid communication with said clutch actuating chamber and said path, and including a fluid exhaust passage connecting therewith; and

differentially sensitive centrifugal valve means including a relief piston slidably mounted in said bore and biased radially outwardly by centrifugal force and by the fluid



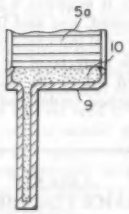
pressure in said clutch actuating chamber acting on said cross sectional area for relieving fluid from said clutch actuating chamber to said exhaust passage, and including a reaction slug disposed within said relief piston and providing an effective cross sectional area less than said predetermined area in communication with fluid pressure in said path which biases said piston radially inwardly.

4,006,809

OIL-IMPREGNATED SINTERED CLUTCH HUB

Hiroshi Seino, Yokohama; Norio Yamada, Yokosuka; Shigeo Kimura, Fujisawa; Hideaki Kosugi, and Koreyuki Yamamoto, both of Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Division of Ser. No. 380,137, July 18, 1973. This application Jan. 8, 1976, Ser. No. 647,635
Claims priority, application Japan, July 19, 1972, 47-71573
Int. Cl.² F16D *13/74*
U.S. Cl. 192—106.2 **3 Claims**



1. A clutch hub of a sintered metal powder, comprising a cylinder with a splined axial bore and a generally disk-shaped extension extending radially from the outer surface of said cylinder, said cylinder having an oil-impregnated layer forming a portion of said cylinder contiguous to the inner surface thereof defining said splined bore and a resin-impregnated layer forming the remaining portion of said cylinder contiguous to the outer surfaces thereof and said oil-impregnated

layer, said extension having a resin-impregnated layer forming a portion of said extension contiguous to the surfaces of extension; whereby a movement of oil, outward and away from said oil-impregnated layer, due to centrifugal forces caused by the rotation of said clutch hub is prevented.

4,006,810

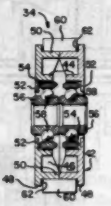
RESILIENT CONVEYOR ROLLERS

Andrew T. Kornylak, Hamilton, Ohio, assignor to Kornylak Corporation, Hamilton, Ohio

Continuation of Ser. No. 385,502, Aug. 1, 1973, abandoned, which is a continuation of Ser. No. 220,151, Jan. 24, 1971, abandoned. This application Mar. 31, 1976, Ser. No. 672,235

Int. Cl.² B65G *13/00*

U.S. Cl. 193—37 **3 Claims**



1. A gravity undriven roller conveyor, comprising: a stationary inclined rigid conveyor support; a plurality of substantially identical idler conveyor rollers serially arranged in a conveying direction downwardly along said inclined conveyor support; bearing means freely rotatably mounted each of said conveyor rollers on said conveyor support with parallel axes of rotation in a common inclined plane, said axes being perpendicular to said conveying direction down said inclined plane for supporting loads on said conveyor rollers and conveying loads from the top of said inclined conveyor support to the bottom of said inclined support solely by gravity; each of said rollers having a rigid wheel including an outer annular bearing surface concentric with its axis of rotation and a pair of axially spaced flanges integrally extending radially outwardly from axially opposed sides of said outer annular bearing surface; an annular tire of elastomeric material freely mounted on each wheel between said flanges and normally being of less axial width throughout its thickness than the corresponding axial space between said flanges; said tire having an inner annular bearing surface of complimentary shape with said wheel outer bearing surface and being mounted on said wheel for free axial and circumferential relative movement between said inner and outer bearing surfaces of said tire and wheel respectively; said tire having a radial thickness greater than the radial depth of said flanges; said elastomeric material of said tire having an elastic limit by which it acquires a permanent deformation when radially compressed; and said flanges being of a radial depth relative to the radial thickness of said tire to completely receive the elastomeric material of the tire and directly engage a load being conveyed before the elastic limit of said elastomeric material is reached under radial compression by the load being conveyed.

4,006,811

REVERSING DEVICE FOR THE LONGITUDINAL ADVANCE OF A RIBBON OF TYPE PRINTERS

Andreas Metschnabl, Nurnberg, and Gottfried Burkhardt, Winkelhaid, both of Germany, assignors to D I E H L datensysteme GmbH, Nurnberg, Germany

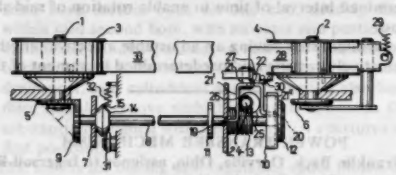
Filed Dec. 2, 1975, Ser. No. 636,912

Claims priority, application Germany, Dec. 3, 1974, 2456989

Int. Cl.² B41J *33/512*

U.S. Cl. 197—161 **2 Claims**

1. A reversing device for the longitudinal advance of a ribbon on type printers for the alternating drive of two reels, which includes: two stationarily journalled shafts adapted to receive and to be coupled to a reel for receiving and supporting a ribbon, two first gears respectively rotatably connected to said shafts, a feed shaft, two second gears fixedly connected to said feed shaft and operable alternately in response to an axial displacement of said feed shaft in one or the other axial direction thereof to drivingly and alternately selectively engage one and the other one of said second gears, a first lever forming a feeler lever and adapted to be controlled by a ribbon on one of said reels, a second lever controllable by said first lever, a first guiding member in the form of a slot defining element, a second guiding member in the form of a pin and extending into said slot, one of said members forming a part of said second lever and the other member being stationarily



arranged, a rotatable shaft journalled stationarily and continuously drivingly connected to said feed shaft, an eccentric keyed to said last mentioned rotatable shaft for rotation therewith, said second lever beng displaceable substantially perpendicularly with regard to the longitudinal axis of said feed shaft and substantially parallelly to the longitudinal axis of said feed shaft by means of the first and second guiding members and said eccentric so as to form a pendulum lever, said pendulum lever comprising a pin engageable by said feeler lever for bringing about a longitudinal movement of said pendulum lever and also comprising two first spaced abutment means, and said feed shaft being provided with two second abutment means, said first abutment means alternately engaging one of said second abutment means for axially and alternately displacing said feed shaft in one and the opposite direction.

4,006,812

AUTOMATIC FEEDING HOPPER

George Everett, Unionville, and Michael Shapcott, Plainville, both of Conn., assignors to Zapata Industries, Inc., Frackville, Pa.

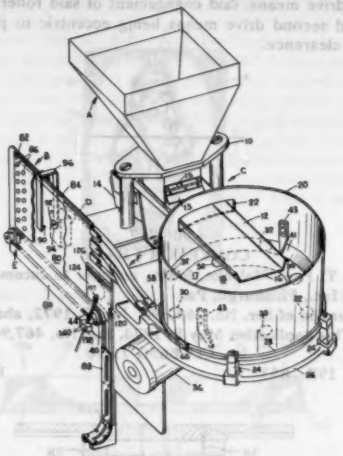
Continuation-in-part of Ser. No. 319,457, Dec. 29, 1972, abandoned. This application Dec. 12, 1974, Ser. No. 532,186

Int. Cl.² B65G *47/24*

U.S. Cl. 198—347 **16 Claims**

1. A hopper for disk-like objects comprising a supply chute, a reservoir for storing the disk-like objects, the reservoir being dimensioned to receive a plurality of substantially horizontal rows of disk-like objects in a substantially vertical plane, feeding means intermediate the supply chute and the reservoir for feeding the disk-like objects to the reservoir, control means responsive to the level of disk-like objects in the reservoir connected to the feeding means to maintain a predetermined level of objects in the reservoir, a conveyor adjoining the reservoir for engagement with a substantial portion of the lowermost row of objects in the reservoir and for removing the disk-like objects from the reservoir, the disk-like objects being

caused by gravity to engage the conveyor, means for driving the conveyor, and an exit chute adjacent the conveyor to



receive the disk-like objects in an aligned row from the conveyor.

4,006,813

ARTICLE SEPARATING AND CONVEYING SYSTEM

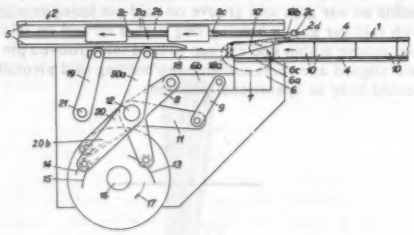
Rene Fluck, Neuhausen am Rheinfall, Switzerland, assignor to SIG Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed July 9, 1974, Ser. No. 487,210

Claims priority, application Switzerland, July 9, 1973, 9964/73

Int. Cl.² B65G 47/26

U.S. Cl. 198—488 **6 Claims**



1. In a device for separating and conveying items, which device includes: an input conveyor for carrying a plurality of aligned items in end to end engagement; an output conveyor arranged for conveying items at a speed higher than that of the input conveyor, the output conveyor being disposed so that its item-receiving end is adjacent, and laterally overlaps, the item-delivery end of the input conveyor; a main pusher disposed adjacent the region of overlap of the two conveyors; and operating means connected to the main pusher for moving the main pusher in synchronism with the output conveyor in a manner to cause the main pusher to engage the foremost item on the input conveyor and to transfer the same to the output conveyor, the improvement comprising an additional, synchronizing pusher; means connected for driving said synchronizing pusher independently of the main pusher; said synchronizing pusher being disposed and driven for controlling the foremost item on the input conveyor and for synchronizing the movement of that item with that of the main pusher; and means defining a guide piece carried by said synchronizing pusher and located in the region between said conveyors at the lateral side of said input conveyor which is near said output conveyor; and wherein said synchronizing pusher further comprises a sensor arranged to be actuated whenever said synchronizing pusher comes in contact with the leading end of an item on said input conveyor in order to stop the drive for both said pushers when there is no item on said item-delivery end of said input conveyor.

4,006,814

APPARATUS FOR THE CONTINUOUS FEEDING OF PALLETIZED FIBER MATERIALS

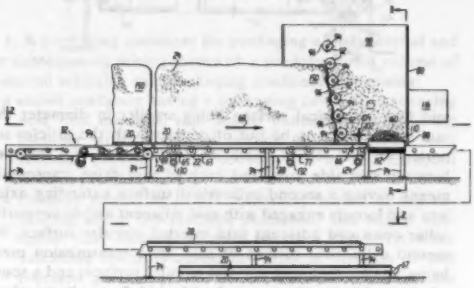
Lambert H. Wilkes; Gary L. Underbrink, both of College Station, Tex., and Joseph K. Jones, Raleigh, N.C., assignors to Cotton, Incorporated, New York, N.Y.

Division of Ser. No. 439,846, Feb. 6, 1974, Pat. No. 3,897,018.

This application Apr. 17, 1975, Ser. No. 569,076

Int. Cl.² B65G 47/31

U.S. Cl. 198—577 **4 Claims**



1. Apparatus for handling fiber-laden pallets comprising:

a generally horizontal bed means having a loading zone and a discharge zone and operable to support a pallet from the loading zone to the discharge zone;

loading conveyor means positioned at the loading zone for translating a pallet at a first predetermined speed longitudinally along the generally horizontal bed means;

means driving said loading conveyor means at said first predetermined speed;

feed conveyor means carried by the generally horizontal bed means, and operable at a second predetermined speed, lower than said first predetermined speed, to translate a pallet at said second predetermined speed to the discharge zone;

means driving said feed conveyor means at said second predetermined speed;

transition conveyor means carried by said generally horizontal bed means between said loading and feed conveyor means for receiving a pallet from said loading conveyor and delivering it to said feed conveyor means;

means selectively driving said transition conveyor means:

at said first predetermined speed to translate a pallet from said loading conveyor into engagement with a preceding pallet being translated at said lower second predetermined speed by said feed conveyor means; and

at said second predetermined speed to maintain said engaged pallets in engaged relationship; and

endless chain means disposed longitudinally of said bed means operable to be engaged by a pallet for moving that pallet onto the bed means.

4,006,815

ARTICLE TRANSPORTING CONVEYOR

Charles W. Werntz, Ferguson, Mo., assignor to Alvey Inc., St. Louis, Mo.

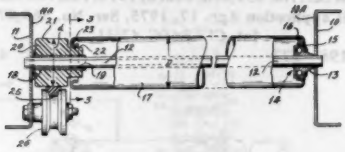
Filed Nov. 11, 1974, Ser. No. 522,473

Int. Cl.² B65G 13/04, 13/071, 13/075

U.S. Cl. 198—781 **4 Claims**

1. An article transporting conveyor comprising spaced side

rails defining the sides of an article transporting path; a plurality of article supporting rollers extending between and of less length than the space between said side rails to make up an article conveying surface along the upper surfaces of said rollers; bearing means engaged in the ends of said rollers positioned adjacent one of said side rails; each of said rollers extending toward the opposite side rail and having an open end spaced from the opposite side rail and formed with an internal circular surface; drive transmission means operatively mounted at said opposite side rail and occupying the space between the open end of each roller and the opposite side rail and in axial alignment with the open ends of said rollers, each of said drive transmission means having a first cylindrical surface exposed in the space between said opposite side rail and the open ends of said adjacent article supporting rollers,



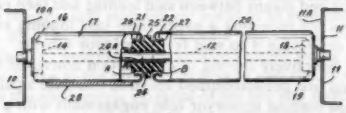
said first cylindrical surface being smaller in diameter than said rollers so as to be out of contact with the articles supported on said rollers which may substantially fill the space between said side rails, and each of said drive transmission means having a second cylindrical surface extending axially into and loosely engaged with said adjacent article supporting roller open end adjacent said internal circular surface, said second cylindrical surface of said drive transmission means being smaller than said internal circular surface; and a source of power frictionally engaged with said first cylindrical surfaces of said drive transmission means, whereby on article stoppage said article supporting rollers slip at said loosely engaged ends on said second cylindrical surface and accumulation of stopped articles causes slippage of said first cylindrical surfaces to limit load on said drive means.

4,006,816

ARTICLE ANTISCRAMBLING AND ACCUMULATING ROLLER CONVEYOR

Charles W. Werntz, Ferguson, Mo., assignor to Alvey Inc., St. Louis, Mo.

Filed May 30, 1975, Ser. No. 582,206
Int. Cl.² B65G *13/07*
U.S. Cl. 198—781 **6 Claims**



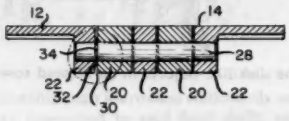
1. An article antiscrambling conveyor comprising: side rails in spaced relation; shafts extending between said side rails; an array of rollers carried by said shafts, certain of said array of rollers including first and second roller sections on the same shaft having the same diameter and being in position so that articles are supported by both sections, all of said first roller sections being adjacent one side rail and being of less length than said second roller sections as measured along said shafts, and said first and second roller sections having open ends in spaced facing relation; first drive means engaged with said first roller sections to drive the same and deliver direct inline propulsion to articles supported thereon for movement on the conveyor; and second drive means operatively supported on said shafts and having opposite ends engaging in said open ends of said first and second sections of said rollers simultaneously to transmit the propulsion of articles by said first roller sections to said second roller sections through said second drive means, said engagement of said roller sections with said second drive means being eccentric to provide a running clearance.

4,006,817

CONVEYOR CHAIN

William T. Paul, Holyoke, Mass., assignor to Incom International Inc., Pittsburgh, Pa.

Continuation of Ser. No. 269,898, July 7, 1972, abandoned.
This application May 8, 1974, Ser. No. 467,969
Int. Cl.² B65G *15/30*
U.S. Cl. 198—853 **10 Claims**



1. A conveyor chain comprising at least two pivotally connected links, each of said links comprising a flat body portion having a container carrying supporting face, two sets of at least two apertured ears projecting from an integral width of said flat body portion and on opposite sides thereof, said ears being spaced in side by side relation with respect to each other to interfit and align with the apertured ears of an adjoining link on the respective sides thereof, the apertures of said ears on each side of said flat body portion being in alignment, a grooved pin disposed in said aligned apertures of said interfitting ears, at least two of said ears being axially displaced to define an ear gap, said groove on said pin being in alignment with said ear gap, a holding ring means locked on said pin at said groove within said ear gap to hold said grooved pin within said aligned apertures and thereby holding said pivotally connected links in operational position.

4,006,818

PACKAGING SHELL WITH HINGED BOTTOM WALL

Albrecht Leo Pieter Wannyn, Vught, Netherlands, assignor to Hamido B.V., 's-Hertogenbosch, Netherlands

Filed Nov. 21, 1973, Ser. No. 417,885
Claims priority, application Netherlands, Nov. 28, 1972, 7216142; Aug. 22, 1973, 7311587
Int. Cl.² B65D *1/34*
U.S. Cl. 206—564 **12 Claims**

1. A package for an article having a peripheral edge in any desired shape, said package comprising a shell formed from a film and including a recess formed in one face of said shell for receiving the article therein, said recess including a bottom wall and a plurality of side walls and having a depth of at least equal to the greatest thickness of the article to be received therein, at least a portion of an opposite pair of said side walls forming an angle less than 90° with said bottom wall whereby said portion retains the article in said recess, a hinge line extending throughout said shell and being formed in said

bottom wall between said pair of said side walls, said bottom wall being bendable about said hinge line to a position wherein

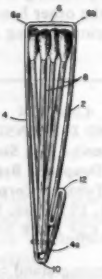
said pair of side walls are spaced apart a distance such that said article can be inserted into said recess.

4,006,819

SAFETY MATCHBOOK HAVING INTERLOCKING COVER PANELS

Benjamin P. Elliott, 11000 Dobbins Drive, Potomac, Md. 20854

Filed May 14, 1975, Ser. No. 577,161
Int. Cl.² A24F *27/00*
U.S. Cl. 206—104 **4 Claims**



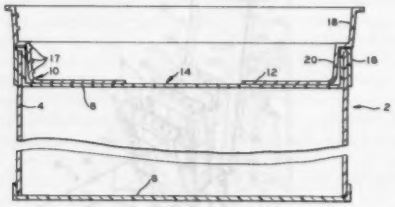
1. A matchbook folder with safety interlock, comprising: a casing formed of a strip of sheet material, the major portion of the strip being folded to form front and back cover panels; one end portion of said strip having a first fold forming a first substantially upstanding U-shaped fold into which a base portion of matches can be securably seated and a second fold extending back into the matchbook and forming a substantially inverted U-shaped fold; the opposite end portion of the strip having a single fold which extends outwardly of the matchbook and forms a further upstanding U-shaped fold which mates with said inverted U-shaped fold in interlocking engagement to prevent disengagement of the panels in the longitudinal direction, the panels being disengaged from each other by relative movement of the end portions in opposite lateral directions.

4,006,820

MIXING CONTAINER

Ernest L. Smith, Kansas City, Mo., assignor to Phillips Petroleum Company, Bartlesville, Del.

Continuation of Ser. No. 364,920, May 29, 1973, abandoned.
This application July 31, 1975, Ser. No. 600,550
Int. Cl.² B65D *25/08*
U.S. Cl. 206—219 **15 Claims**



1. A packaging container for packaging a first material and for subsequently mixing therewith a predetermined volume of a second material, said packaging container comprising:

a sealed container having a packaging cavity for packaging said first material, said sealed container having a top member with a recessed portion formed therein, said recessed portion having sidewalls and an uninterrupted bottom member; and

a concave measuring vessel removably nested in and extending above the recessed portion of said sealed container, said measuring vessel having a bottom member extending inwardly across said bottom member of said recessed portion of said sealed container, said bottom member of said measuring vessel being sealed to said bottom member of said recessed portion of said sealed container, said bottom member of said measuring vessel having an opening extending therethrough, the portion of said bottom member of said recessed portion of said sealed container below said opening being capable of being readily perforated to permit a volume of said second material contained in said measuring vessel to enter said packaging cavity and mix with the first material contained therein.

4,006,821

MULTI-TRAY CONTAINER FOR STORING ELONGATE OBJECTS

Karl Sautter, Ammerbuch-Reusten, Germany, assignor to Georg Knoblauch Werkzeugkassetten-fabrik, Giengen, Germany

Filed Dec. 29, 1975, Ser. No. 645,013
Claims priority, application Germany, Dec. 28, 1974, 2461766
Int. Cl.² B65D *85/29*
U.S. Cl. 206—379 **7 Claims**

1. A container for storing a plurality of elongated objects, such as drill bits, screw taps and the like, comprising

a. an open-topped body member (10) having a horizontal bottom wall and vertical side and end walls;

b. a lid member (12) pivotally connected with said body member for pivotal movement between closed and open positions relative thereto;

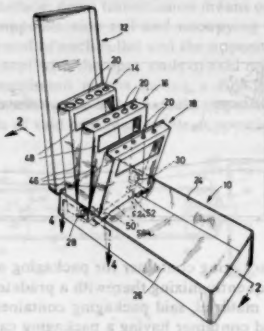
c. at least two trays (14, 16, 18);

d. pivot means (28) pivotally connecting said trays at one end with said body member for pivotal movement about a common pivot axis parallel with both said body bottom wall and the pivot axis of said lid member, said trays being pivotally displaceable between stacked retracted positions within said body member and extended positions in which the other ends of said trays extend through the top of said body member;

e. connecting means (22) connecting said lid with a first one

(14) of said trays to cause said first tray to be displaced toward its extended position when the lid is pivoted toward the open position relative to said body member; and

f. abutment means (38*a*, 38*a*; 50*a*, 52*a*) adjacent one end of one of said trays for causing the other tray to be displaced toward its extended position when said first tray is displaced by said lid toward its extended position, said trays being returned to their retracted positions when the lid is pivoted to the closed position relative to the body member, said abutment means comprising at least one abutment surface arranged on one of said trays adjacent said common pivot axis for cooperation with a corresponding surface on the other of said trays.



4,006,822

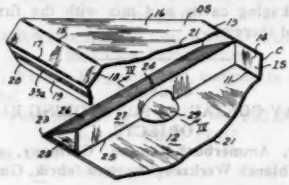
MAILING CARTON

Richard J. McCall, 1515 North Sedgwick St., Chicago, Ill. 60610

Filed Nov. 18, 1975, Ser. No. 632,956

Int. Cl.² B65D *85/30*

U.S. Cl. 206—424 **1 Claim**



1. A mailer carton formed from a one-piece blank, the blank being T-shaped and having substantially parallel first fold lines forming and hingedly connecting bottom, rear, top, and front walls and having parallel second fold lines disposed perpendicularly to said first fold lines to form side members hingedly connected to said bottom wall, the second fold lines forming first, second, and third side flaps, said carton being substantially rectangular, having an enclosed chamber for receiving a heavy article, and comprising:

bottom, rear, top, and front walls enclosing said chamber on four sides; and

a pair of side members enclosing said chamber on opposite ends thereof, each of said members forming a protective air pocket therewithin which is triangular in cross-section, and each of said side members comprising:

a first inclined side flap connected to said bottom wall and extending inwardly and upwardly thereof to engage against said top wall,

a second, vertical side flap extending from said first inclined flap to said bottom wall and from said front to said rear wall,

a third, sidewardly extending side flap connected to said second side flap and extending outwardly from said second side flap, an edge of said third side flap engaging an inside surface of said first, inclined side flap, and

a horizontal tab affixed to said third flap and severed from said second flap, said tab being positioned to overlie the bottom wall of the carton to be captured beneath the heavy article; whereby said first and third flaps reinforce said second, vertical side flap independently of the rest of the carton to support the article protectively between the opposite vertical flaps of said side members spaced inwardly of said side edges of said top and bottom walls.

4,006,823

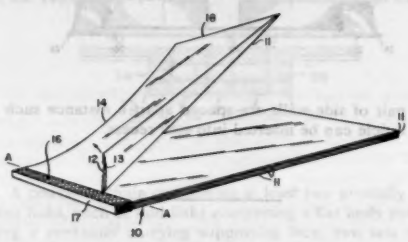
STERILE BAG PAD

Ricardo Hurtado Soto, Apartado 91711, Bogota, Colombia

Filed Feb. 25, 1976, Ser. No. 661,405

Int. Cl.² B65D *31/00, 85/54*

U.S. Cl. 206—554 **4 Claims**



1. An article comprising a plurality of closed, sterile bags of thin, flexible thermoplastic sheet material aligned and arranged in side-by-side relation and bound together along a common marginal edge with a heat-fused thick, stiffened binding whereby all of said bags form a book-like pad, the ends of said bags opposite said binding being free and the edges of said bags adjacent said binding being weakened but continuous adjacent said binding, whereby a bag may be removed from said pad by holding said binding in one hand, grasping the free end in the other hand and tearing along the line of weakness to separate the bag from the binding in an opened condition.

4,006,824

DISPLAY AND DISPENSING STAND

Robert R. Snediker, Winnetka, Ill.; Steve Chalmers, St. Louis, Mo., and Robert E. Drapeau, Berwyn, Ill., assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Nov. 11, 1975, Ser. No. 631,130

Int. Cl.² A47F *5/11*

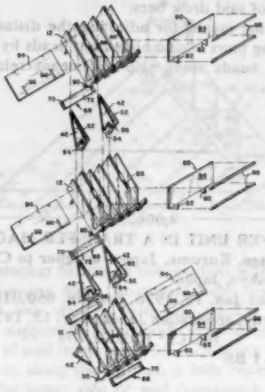
U.S. Cl. 211—49 D **37 Claims**

1. A display and dispensing stand comprising:

a. a plurality of unitary trays having at least one channel for containing articles, said channel being formed by a plurality of upstanding sidewalls, said trays including at one extremity of said channels a frontal abutment means, said side walls including two support side walls symmetrically placed with respect to the width of said tray, said support side walls including a plurality of receiving fissures therein, said receiving fissures comprising upper receiving fissures accessible from above said tray and lower receiving fissures accessible from below said tray;

b. at least two planar supporting members spacially separating said trays one above the other, each of said supporting members having at least two connecting blades, an upper connecting blade engaging the lower fissure of the tray above said supporting member and a lower connecting blade engaging the upper fissure of the tray below said

supporting member, said supporting member further including means for detachably affixing said trays to said supporting member to prevent relative movement therebetween; and



c. means for inclining said trays, said inclining means being placed beneath the bottom tray of said display stand.

4,006,825

NOVEL FISHING ROD SUPPORT

Milton Austin, 3 Spielman Road, Fairfield, N.J. 07006, and Arthur G. Kendall, 37 Passaic Ave., Livingston, N.J. 07039

Filed Mar. 17, 1975, Ser. No. 558,961

Int. Cl.² A47F *7/00*

U.S. Cl. 211—60 R **10 Claims**

1. A fishing rod support comprising a pair of cooperating bracket members adapted for attachment to either a horizontal or a vertical surface to support said fishing rod, said bracket members comprising:

a proximal bracket member adapted to receive the handle portion of said rod;

a distal bracket member possessing a U-shaped channel adapted to receive the tip portion of said rod, the longitudinal dimension of said channel lying in a plane parallel to the plane of said surface, and said channel possessing a mouth defined by a first and a second peripheral edge of said distal bracket member; and

means associated with said channel for retaining said tip portion securely therein comprising a lip extending into said mouth from said first peripheral edge in a plane perpendicular to said longitudinal dimension to partially obstruct said mouth, and a gate located in a plane parallel with the plane of said lip, said gate moveably anchored at one end thereof to said second peripheral edge, and adapted to pivot into position to fully obstruct said mouth and thereby prevent the escape of said tip.

4,006,826

GARMENT HANGER

Walter Rich, 1911 Spruce St., Philadelphia, Pa. 19103

Filed Apr. 2, 1975, Ser. No. 564,236

Int. Cl.² A47F *5/08*

U.S. Cl. 211—101 **11 Claims**

1. A hanger comprising structure attachable to a wall for supporting mounting brackets, a pair of mounting brackets for projecting in spaced parallel cantilever relation from said structure for supporting a hanger device, a hanger device including a hanger rail coupled to said brackets by a pair of arms, each arm having an upper end connected to said hanger rail and a lower end pivotably connected to one of said brackets, a handle pivotably connected to said hanger device between said arms for pivoting said arms about a horizontal axis to thereby lower the elevation of said hanger rail, and spring means having a first end and a second end, means for fixedly attaching said first end of said spring means to a first point which is stationary relative to said brackets, means for attaching said second end of said spring to a second point on one of said arms, the location of the second point with respect to said horizontal axis being such that an imaginary line connecting said first and said second points is disposed above said horizontal axis when said hanger rail is in its upper position and at least a portion of said imaginary line is disposed below said horizontal axis when said hanger rail is in its lower position, whereby said hanger rail is maintained in each of its upper and lower positions.

4,006,827

FILE ORGANIZER

George Henry Wiseman Riches, 170 Rochampton Ave., Toronto, Ontario, Canada (M4P1R2)

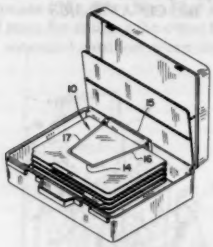
Filed Sept. 15, 1975, Ser. No. 613,613

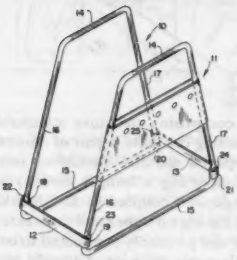
Int. Cl.² A47F *5/10*

U.S. Cl. 211—201 **5 Claims**

1. A portable collapsible file holder and organizer comprising a pair of substantially rigid spaced frames forming a storage space therebetween, each of said frames having lateral side portions, top and bottom portions, said bottom portions forming a base on which the organizer stands when upright, and a pair of connecting members on which files are to be supported, said members adjustably interconnecting the frames adjacent the base only for to-and-fro adjustable movement of the frames relative to each other and to maintain said frames in spaced apart substantially parallel relationship between a fully opened position and a fully collapsed position and at intermediate positions therebetween whereby the frames retain said files in all said positions, the space between

said frames being open and unobstructed above said base for receiving files therein, said files being supported either horizontally when said frames are horizontal or vertical when arranged upright.

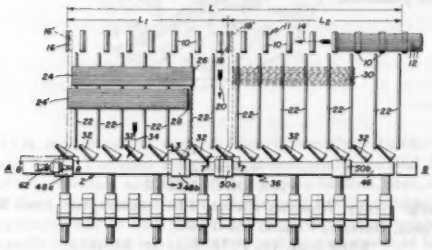




4,006,828
APPARATUS FOR ALIGNING THE ENDS OF PRODUCT LENGTHS

William J. Hill, Holden, Mass., assignor to Morgan Construction Company, Worcester, Mass.

Filed Aug. 11, 1975, Ser. No. 603,368
Int. Cl.² B21B 39/20
U.S. Cl. 214—1 P 10 Claims



1. Apparatus for aligning the ends of product lengths delivered laterally into a longitudinally extending alignment zone, said apparatus comprising:

a stationary support frame located proximate to said alignment zone;

elongated rail means fixed to said support frame, said rail means extending in a direction parallel to the length of said alignment zone;

a plurality of pairs of first and second alignment heads carried on said rail means for movement along the length thereof, each of said alignment heads having a product contacting surface extending into said alignment zone;

two draw bars carried on said support frame;

drive means for axially reciprocating said draw bars simultaneously in opposite directions relative to said support frame;

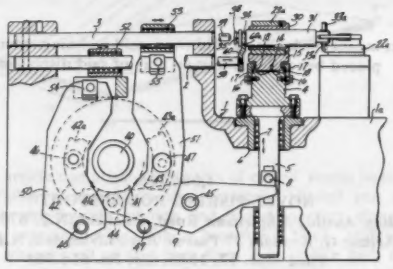
locking means for connecting said draw bars to said alignment heads, the locking means associated with said first alignment heads being releasably engageable with one of said draw bars and the locking means associated with said second alignment heads being releasably engageable with the other of said draw bars;

and positioning means for adjusting the distance between cooperating pairs of said alignment heads by moving said alignment heads along said rail means relative to said draw bars.

4,006,829
TRANSFER UNIT IN A TRANSFER MACHINE

Yoshio Tokunaga, Kurume, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Jan. 19, 1976, Ser. No. 650,018
Claims priority, application Japan, Apr. 15, 1975, 50-45598
Int. Cl.² B65G 25/04
U.S. Cl. 214—1 BB 7 Claims



1. A transfer unit for a transfer machine provided with a number of working stations which are arranged in tandem at a fixed interval therebetween, said transfer machine being designed for transporting a work piece from one to the next working station for performing a series of operations on said work piece, comprising:

a mounting table movable intermittently in the work transfer direction and in the opposite direction by a pitch equal to the interval between the adjacent working stations;

a plurality of mounting blocks arranged on said mounting table at the same interval as that of said working stations and configured for being adjusted slightly in their positions in both vertical and transfer directions;

a chuck shaft slidably coupled to each of said mounting blocks and movable along longitudinal axis of said chuck shaft, said chuck shaft being mounted traversely to said transfer direction and each said chuck shaft carrying at its front end a pair of chuck jaws;

guide means provided on said chuck jaws and engageable with guide portions provided in turn on a jig unit mounted on each of said working stations;

a mounting plate for reciprocally supporting said mounting table; and

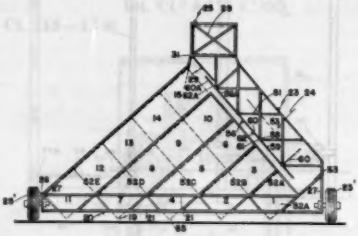
a cam shaft mounted in parallel with said tandem arranged working stations and carrying a plurality of cam plates which are adapted for cooperating with cam levers associated therewith, said cam levers being configured respectively for opening and closing the chuck jaws, longitudinally displacing said chuck shaft, elevating and lowering said mounting table and displacing said mounting table in the transfer direction.

4,006,830

HAY BALE STACKER

Brian Knaggs, General Delivery, Elm Creek, Canada

Filed Dec. 8, 1975, Ser. No. 638,377
Int. Cl.² B65G 57/32
U.S. Cl. 214—6 B **11 Claims**



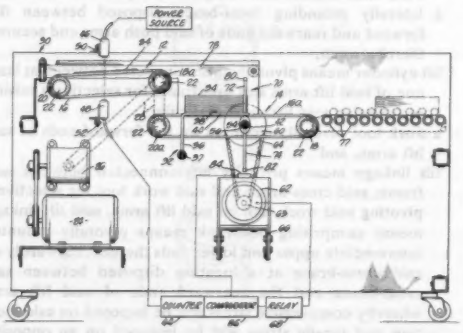
1. A bale stacker for use in conjunction with a baler and a conveyor receiving bales from said baler and transferring same to said bale stacker; said bale stacker comprising in combination supporting framework, ground engaging means on each side of said framework, for facilitating the movement of said stacker along the ground, a bale receiving chamber formed on the upper side of said framework and receiving bales one at a time from the associated conveyor, an outlet gate hingedly mounted in the base of said chamber and forming said base, trip means actuated by the particular bale in said chamber to release said outlet gate, means to return said outlet gate to the closed position after said bale has passed therethrough, an inclined transfer chute extending from below said chamber downwardly and outwardly therefrom, a plurality of bale receiving chutes extending from the base of said transfer chute and being situated in side by side relationship substantially at right angles to the longitudinal axis of said transfer chute, bale receiving forks at the bases of said bale receiving chutes, and automatically opening chute gates forming the base of said transfer chute, said chute gates including spring means normally urging the chute gates to the closed position the weight of a bale thereon opening said chute gates against the pressure of said spring means.

4,006,831

AUTOMATIC TORTILLA COUNTER AND STACKER

James A. Jimenez, Temple City, Calif., assignor to Electra Food Machinery, Inc., El Monte, Calif.

Continuation-in-part of Ser. No. 448,527, March 6, 1974, abandoned. This application July 28, 1975, Ser. No. 599,649
Int. Cl.² B65G 57/14
U.S. Cl. 214—6 D **3 Claims**



1. An apparatus for stacking semi-rigid generally planar shaped articles comprising:

a. first conveyor means for sequentially receiving the articles to be stacked and moving them forwardly of the apparatus;

b. a second conveyor means disposed forwardly of and below said first conveyor means for moving the articles forwardly of the apparatus, said second conveyor means comprising a plurality of spaced apart article-carrying belts;

c. a pivotally mounted rack disposed proximate said second conveyor means and having a plurality of spaced apart fingers defining an article receiving surface, said rack being pivotally movable from a first article receiving position wherein said fingers are substantially horizontal to a second article dispensing position wherein said fingers are inclined and interleaf between said belts of said second conveyor means;

d. means for moving said rack from a first position to a second position including a rotatable shaft, motor means for rotating said shaft and a cam connected to said shaft, said cam being rotatable through 360° and disposed in operative engagement with at least one finger of said rack and being adapted to pivotally move said rack from the first position to the second position upon rotation of said cam;

e. first and second oppositely extending locating arms connected to said rotatable shaft and rotatable therewith through 360°, said arms being movable from a first position wherein said arms are substantially normal to the plane of said fingers of said rack in its first position to a second position wherein said arms are substantially parallel to the belts of said second conveyor means;

f. magnets affixed to the extremities of said first and second locating arms;

g. sensor means adapted to sense the passage of each article toward said rack and to thereupon generate and transmit a signal;

h. counter means operatively associated with said sensor means for receiving and counting signals transmitted thereby and for transmitting signals to said motor means upon receipt of a predetermined number of signals from said sensor means to activate said motor means to rotate said shaft; and

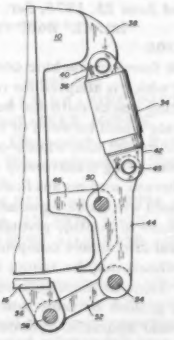
i. magnetically responsive means operably interconnected with said motor for stopping said motor when said magnets move into operable communication with said means.

4,006,832

BUCKET DOOR SNUBBER

Marvin L. Auxer; Floyd E. McCann, and Gerald D. Shepherd, all of Tulsa, Okla., assignors to Unit Rig & Equipment Co., Tulsa, Okla.

Filed June 18, 1975, Ser. No. 587,951
Int. Cl.² E02F 3/81, 3/84; F16F 7/00
U.S. Cl. 214—146 R **4 Claims**



1. Apparatus for dampening the closing of a heavy door of

the type mounted for swinging movement along a hinge axis, said hinge axis being located on a heavy movable member, and wherein the closing of the door is effected by moving the movable member in a direction to cause the door to swing by inertia about its hinge axis towards its closed position with respect to said movable member, wherein the improvement comprises a dampening apparatus including a crank having first and second opposite ends, said crank being pivotally mounted intermediate its ends on said movable member adjacent said hinge axis, linkage means pivotally mounted adjacent one end thereof on said door and pivotally connected adjacent an opposite end thereof to said first end of said crank, a cushioning device having a lower pivotal connection pivotally connected to said second end of said crank and an upper pivotal connection pivotally connecting said cushioning device to said movable member; said cushioning device having an outer housing with a flat portion thereon, an inner housing telescopically received within said outer housing and having a flat end disposed adjacent the flat portion of said outer housing, bolt means connected at one end to the flat portion of said outer housing and extending through and beyond the flat end of said inner housing, rubber pad means mounted on said bolt means between said flat portion and said flat end, a plurality of rubber pad means mounted on said bolt means between said flat end and the end of said bolt opposite from said one end thereof, said opposite end of said bolt means being threaded, washer means mounted on said opposite end of said bolt means adjacent said rubber pad means, and nut means threadedly received on said bolt means adjacent said washer means and on the opposite side thereof from said rubber pad means, said outer housing being integral with one of the pivotal connections for said cushioning device, said inner housing being integral with the other of said pivotal connections for said cushioning device; whereby, as said door moves past a predetermined position towards its closed position, the lower pivotal connection on said cushioning device will move away from said movable member and beyond the line between the upper pivotal connection for said cushioning device and the intermediate pivotal connection for said crank; and whereby, when said door moves further past said predetermined position towards its closed position, said second end of said crank will exert a pulling force on the lower pivotal connection of said cushioning device to compress said plurality of rubber pads between said flat end and said washer means.

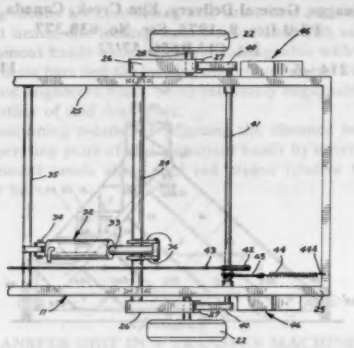
4,006,833

LOWERING DEVICE FOR UNLOADING OR LOADING HAYSTACKS

Chester G. Neukom, Jamestown, and Ivyl D. Kopecky, Ypsilanti, both of N. Dak., assignors to Haybuster Manufacturing Inc., Jamestown, N. Dak.

Filed June 25, 1975, Ser. No. 590,392
Int. Cl.³ B60P *1/04*
U.S. Cl. 214—506 **7 Claims**

1. A haystack forming machine comprising a bed for forming a stack and which is adapted for removing stacks from the bed and replacing stacks onto the bed including a frame, at least one separate wheel on each of the opposite sides of said frame, means to mount said wheels on said frame including a tube member extending transversely of said frame and pivotally mounted thereto, arm means fixed to opposite ends of said tube member, said wheels being attached to outer ends of said arm means, means to control pivotal movement of said tube member and said arm means comprising a hydraulic cylinder, whereby said wheels may be swung in an arc relative to said pivot and said frame to thereby lower portions of said frame relative to the ground or raise said portions upon opposite movement of said hydraulic cylinder, and mechanical latch means engageable with said arm means adjacent to the mounting of at least one of said wheels to said arm means, said mechanical latch means being pivotally mounted to said frame member and positionable to directly mechanically engage said



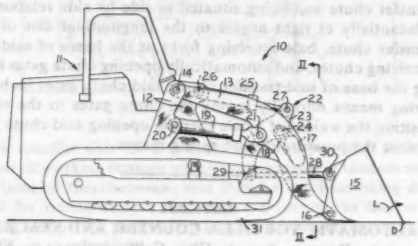
arm means to support said frame relative to said arm means independently of said means to control movement.

4,006,834

TILT LINKAGE FOR LOADER BUCKETS

Reynold M. Anderson, Morton, and Donald E. Tullar, Metamora, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 15, 1976, Ser. No. 649,310
Int. Cl.² E02F *3/82*
U.S. Cl. 214—776 **11 Claims**

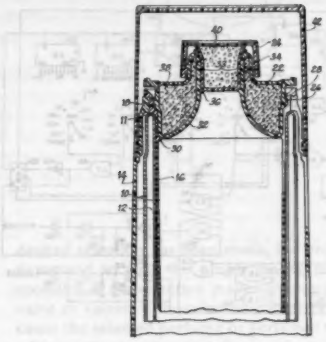


1. A construction vehicle comprising
a tractor having a frame,
a pair of laterally spaced lift arms having rearward ends thereof pivotally mounted on said frame and having forward ends thereof extending forwardly of said tractor,
a laterally extending cross-brace disposed between the forward and rearward ends of said push arms and secured therebetween,
lift cylinder means pivotally interconnected between at least one of said lift arms and said frame for selectively raising or lowering said lift arms vertically,
a work tool pivotally mounted on the forward ends of said lift arms, and
tilt linkage means pivotally interconnected between said frame, said cross-brace and said work tool for selectively pivoting said work tool on said lift arms, said tilt linkage means comprising bellcrank means pivotally mounted intermediate upper and lower ends thereof rearwardly on said cross-brace at a location disposed between said cross-brace and the rearward ends of said lift arms whereby compressive stress will be imposed on said location and tensile stress will be imposed on an opposite, forward surface on said cross-brace from said location upon pivoting of said work tool on said lift arms during operation thereof.

4,006,835
CONVERTIBLE STOPPER FOR A WIDE MOUTH THERMOS

John S. Cummings, Nashville, Tenn., assignor to Aladdin Industries, Incorporated, Chicago, Ill.

Continuation of Ser. No. 446,694, Feb. 28, 1974, abandoned.
This application Jan. 22, 1976, Ser. No. 651,458
Int. Cl.² A47J *41/00*
U.S. Cl. 215—13 R 5 Claims



1. In a wide mouth thermos bottle having a vacuum filler, a protective jacket disposed about said filler and a liner conforming to the interior of said filler, the improvement comprising:

a compound stopper including a hollow toroidal stopper having a central narrow opening therethrough removably engaging said liner at a top portion thereof for converting the thermos from a wide mouth opening to a relatively narrow opening, said hollow toroidal stopper being filled with insulation, and

a narrow mouth stopper for sealing said narrow opening.

4,006,836
SAFETY CAP

Lewis A. Micallef, Fort Lee, N.J., assignor to Leeds and Micallef, Fort Lee, N.J.

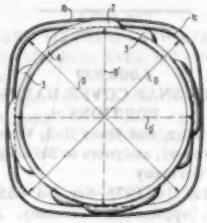
Filed Jan. 8, 1976, Ser. No. 647,328
Int. Cl.² B65D *55/02, 85/56;* A61J *1/00*
U.S. Cl. 215—218 23 Claims

1. A safety cap for a container comprising; an outer cover having an end wall and a peripheral skirt depending therefrom, a band mounted in the cover, means in the band for rotatably fastening and unfastening the band and cover on a container, lock means on the band and cover to permit rotating of the band and cover onto the container into the fastened position and to prevent rotating of the band and cover into the unfastened position, and release means on the band and cover adapted to be shifted between an inactive position whereupon it does not affect the operation of the lock means and an active position whereupon it deactivates the lock means and permits the band and cover to rotate into the unfastened position.

4,006,837
CONTAINER CLOSURE

Gerald G. Gates, Wheeling, W. Va.; Charles J. Hasper, Jr., Bellaire, Ohio; Milton H. McCann, Wheeling, and Richard D. Francis, Moundsville, both of W. Va., assignors to Wheeling Closure Corporation, Wheeling, W. Va.

Filed Oct. 30, 1974, Ser. No. 519,259
Int. Cl.² B65D *41/04*
U.S. Cl. 215—340 8 Claims



1. A container closure comprising a top wall, a continuous skirt portion depending from the perimeter of said top wall, a continuous reinforcing bead provided on the lower end of said skirt portion adapted to engage interrupted thread portions on a container, said reinforcing bead being of uniform thickness throughout its extent, a portion of said closure having a radial dimension greater than the corresponding radial dimension of the container thread portions, and another portion of said closure having a radial dimension less than the corresponding radial dimension of the container thread portions, whereby when applying the closure to the container the portion of the closure having the greater radial dimension is aligned with the thread portions to thereby position said portion radially outwardly from said threads, and by rotating said closure, the portion of the bead at the shorter radial dimension of the closure is caused to underlie and engage the container threads thereby tightening the closure on the container.

4,006,838
BRAZING ALLOY AND BRAZING PASTE FOR GAS CONTAINER JOINTS

Richard S. Baumann, Glenbeulah, and Ronald K. Rabeln, Green Bay, both of Wis., assignors to Western Industries, Inc., Milwaukee, Wis.

Division of Ser. No. 526,912, Nov. 25, 1974, abandoned. This application Feb. 17, 1976, Ser. No. 658,275
Int. Cl.² F17C *1/14;* B32B *1/02*
U.S. Cl. 220—3 2 Claims

1. A steel container for pressurized gas which tends to react with an alloy containing more than 67% copper to form an explosive compound; said container consisting of a plurality of components steel in sealed relationship by a brazing alloy of pressurized gas therebetween, being joined and brazing alloy

being exposed to said pressurized gas within said container, said alloy consisting of: about 48% to about 67% by weight of

copper; about 4.5% to about 7% by weight of phosphorous; and the balance nickel.

4,006,839

CONTAINER WITH SNAP COVER HAVING FRANGIBLE PORTIONS

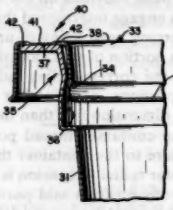
Alfons W. Thiel, Mainz, and Hans Hell, Wiesbaden-Freudenberg, both of Germany, assignors to Bellaplast GmbH, Wiesbaden-Biebrich, Germany

Filed Mar. 10, 1976, Ser. No. 665,409

Claims priority, application Germany, July 28, 1975, 2533631

Int. Cl.² B65D *41/32*

U.S. Cl. 220—266 **24 Claims**



1. A container assembly having a safeguard against undetectable unauthorized or partial opening after a cover is initially applied comprising a container adapted to receive material to be packaged and having an open end, a cover for said open end, said container and said cover having around their outer peripheries generally flat annular edge regions in coextensive adjacent relation, cooperating formations on the cover and container providing a reusable snap fit connection between the cover and container permitting the cover to be reapplied with a snap fit after each removal from the container, and said safeguard being independent of said formations and comprising fastening means fixedly connecting said edge regions closely together after a container has initially been filled and the cover snapped thereupon over the opening, said fastening means being so constructed and arranged that upon rupture of fastening means for separation of said regions for partially or fully opening said container assembly a tear line pattern is formed at least in the cover edge region adjacent said ruptured fastening means, said tear line pattern being such that upon reclosure of the cover the cover and container edge regions cannot be undetectably reassembled in the initial cover closed condition.

4,006,840

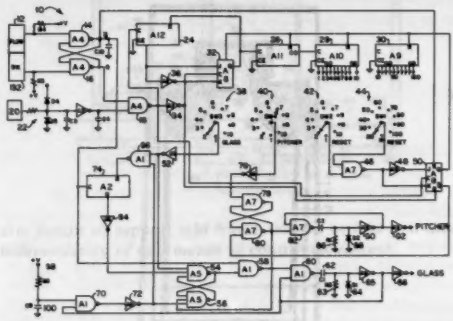
BEVERAGE DISPENSER HAVING FLOW-ACTUATED SENSING MEANS

Joseph W. Shannon, Kent, Ohio, assignor to American Beverage Control, Kent, Ohio

Filed July 7, 1975, Ser. No. 593,847

Int. Cl.² B67D *5/54*

U.S. Cl. 222—30 **9 Claims**



1. A beverage dispenser apparatus for monitoring the volume of beverage dispensed from a mass reservoir through a dispensing line and out a pouring head, comprising:

valve means for permitting the flow of beverage from the mass reservoir and through the dispensing line;

switch means operatively engaged with the dispensing line and actuated by the flow of said beverage;

a counting circuit connected to and actuated by said switch means;

decode means connected to said counting circuit for producing output signals at selected time intervals after the actuation of said switch means, said time intervals corresponding with preselected volumes dispensed; and

recording means connected to said decode means for recording the dispensing of a first preselected volume only after said flow of beverage through the dispensing line has terminated, recording the dispensing of a second preselected volume immediately upon receipt of an output signal from the counting circuit indicating that such second volume has been dispensed and being inhibited from recording the dispensing of third preselected volumes until a fixed number of said third preselected volumes have been dispensed, at which time said recording means records the dispensing of a volume equal said first preselected volume.

4,006,841

PERFUME DISPENSER

Girair Hagop Alticosalian, 27 Beaufort Road, Ealing, W.5., England

Filed July 14, 1975, Ser. No. 595,799

Claims priority, application United Kingdom, July 24, 1974, 32752/74

Int. Cl.² B67D *5/22, 5/60*

U.S. Cl. 222—42 **6 Claims**

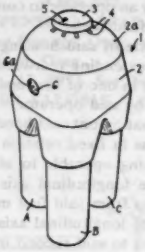
1. A perfume dispenser comprising:

a holder for holding a plurality of perfume containers, each containing a liquid perfume of a different fragrance,

a selector device which, when the plurality of containers are located in the holder, enables liquid perfume from any one or from a combination or combinations of the containers to be selected for dispensing through an outlet of the dispenser, and

an actuating means operable to cause the release of a quantity of the selected liquid perfume or perfumes into a mixing chamber and from said chamber to said outlet,

wherein said selector device is in the form of a push-button which is rotatable to predetermined angular positions relative to said holder to effect the desired selection and which is provided with a region carrying said actuating means in the form of a series of spaced projections, whereby when the push-button is depressed after the



desired selection has been made, the projections are also depressed so that the projection or projections corresponding to the selection made can engage with the outlet valve or valves of the selected container or containers to cause the selected perfume or perfumes to be fed through said mixing chamber and dispensed at said outlet.

4,006,842

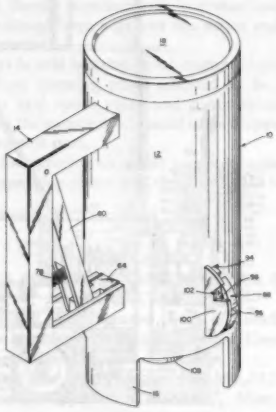
MATERIAL MEASURING AND DISPENSING DEVICE

Anthony L. Bassignani, 17 King St., Norfolk, Mass. 02056

Continuation-in-part of Ser. No. 466,732, May 3, 1974, Pat. No. 3,907,166. This application Sept. 18, 1975, Ser. No. 614,702

Int. Cl.² G01F *11/28*

U.S. Cl. 222—43 **8 Claims**



1. A device for measuring and dispensing granular material which comprises:

a container for the material having a material discharge outlet opening at the bottom thereof;

dispensing means including a plurality of closely adjacent material receiving compartments open at top and bottom, a barrier member for shielding the tops of said compartments from said outlet opening at one position relative to said compartments, and a closure member for closing the bottoms of said compartments at one position relative to said compartments;

mounting means fixedly mounting said compartments at said outlet opening and mounting said members for reciprocation across the tops and bottoms respectively of said compartments;

reciprocating means for reciprocating said members between a single dispense position in which all of said compartments are shielded at their tops from said outlet opening by said barrier member and are opened at their bottoms by said closure member, and a plurality of fill positions in which selected different numbers of said compartments have the tops thereof exposed to said outlet opening by said barrier member and the bottoms thereof closed by said closure member;

operating means for said reciprocating means accessible from the exterior of the device; and

control means adjustable to stop the movement of said members by said operating and reciprocating means at selected fill positions corresponding to said selected numbers, including adjustment means for said control means accessible from the exterior of the device and operable to set said control means to stop said movement at said selected positions, and indicator means showing the compartment capacity to be filled and dispensed at each setting of said adjustment means.

4,006,843

APPARATUS AND METHOD OF WATERING OBJECTS

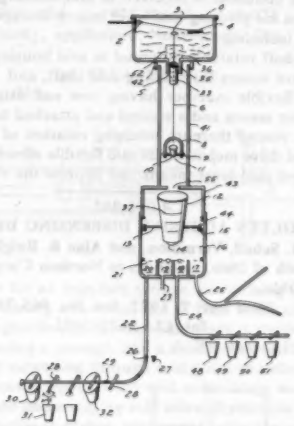
Antonio Martinez Martinez, Avda. del Manzanares No. 148, Madrid, Spain

Filed Apr. 16, 1975, Ser. No. 568,580

Claims priority, application Spain, Apr. 20, 1974, 425543

Int. Cl.² B67D *5/08*

U.S. Cl. 222—68 **16 Claims**

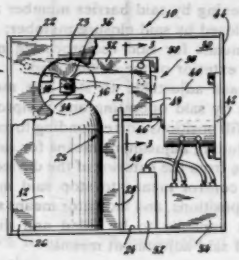


1. A method of watering objects, comprising the steps of receiving water in a tank having a passage formed with an orifice through which the water may flow; metering quantities of the flowing water per unit time by moving an elongated tubular element having a plurality of differently-sized first holes spaced longitudinally along said element and lying in substantially parallel transverse planes with respect to each other, and a plurality of second holes spaced longitudinally along said element and alternatingly between said first holes and operative for communicating each of said first holes with the exterior of said element, said step of moving said element including registering a selected one of said first holes with said orifice so as to selectively vary the amounts of water flowing through said first holes to be expelled from said element; collecting said metered quantities of expelled water; automatically discharging the collected quantities of water whenever they reach a predetermined amount; and conducting the discharged amount of water towards the objects to be watered.

4,006,844
APPARATUS FOR OPERATING AN AEROSOL CONTAINER

Charles James Corris, Camden, S.C., assignor to The Risdon Manufacturing Company, Naugatuck, Conn.

Filed Apr. 10, 1975, Ser. No. 566,959
Int. Cl.² B67D 5/28
U.S. Cl. 222—70 5 Claims



1. An apparatus for operating an aerosol container to dispense the contents thereof, the container having a dispenser valve at one end actuated through a valve stem urged outwardly therefrom to a normally closed position away from a depressed open position, said apparatus comprising:

A. a housing formed to receive at least the valved end of the container;

B. lever means pivotally mounted in said housing, operatively associated with the valve stem when the valved end of the container is received in said housing; and

c. means for pivoting said lever means to depress the valve stem including

1. a shaft rotatably mounted in said housing;

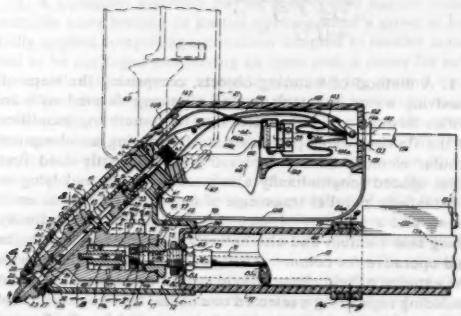
2. drive means for rotating said shaft; and

3. a flexible member having one end attached to said lever means and a second end attached to said shaft to be wound thereon; whereby rotation of said shaft by said drive means winds said flexible member thereon to pivot said lever means and depress the valve stem.

4,006,845
MOLTEN ADHESIVE DISPENSING DEVICE

Charles H. Scholl, Vermilion, and Alan B. Reighard, Bay Village, both of Ohio, assignors to Nordson Corporation, Amherst, Ohio

Filed Apr. 7, 1975, Ser. No. 565,733
Int. Cl.² B67D 5/62
U.S. Cl. 222—146 HE 11 Claims



1. A hand gun adapted to discharge molten adhesive feedstock as desired by an operator, said gun comprising

a gun housing having a barrel portion and an adhesive feed portion, the longitudinal axes of said barrel and adhesive feed portions being oriented at an acute angle relative one to the other,

a heater body positioned within said gun housing, said heater body including at least one heater cartridge thermostatically controlled to maintain the molten adhesive feedstock within said gun at the desired temperature level,

a discharge valve positioned within said gun housing and connected with said heater body, said discharge valve being operable by an operator to control discharge of said molten adhesive feedstock,

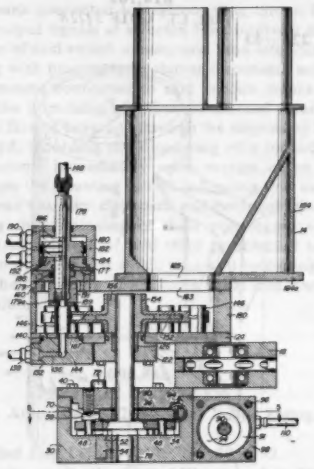
a handle fixed to one of said housing's portions at the aft end thereof and extending rearwardly thereof, said handle being located in one of first and second mount locations as selected by said operator,

connector means that mount said handle to that one of said housing's portions in fixed relation therewith, said connector means being operable to allow swinging of said handle about the longitudinal axis of that one of said housing's portions from said first mount location generally normal to the longitudinal axis of the other of said housing's portions to said second mount location generally parallel to the longitudinal axis of the other of said housing's portions, said second mount location being substantially 180° removed from said first mount location, and said handle's longitudinal axis being oriented at a generally acute angle relative to the longitudinal axis of that one of said housing's portions at both mount locations.

4,006,846
INDEXING POWDER DISPENSING DEVICE

Robert G. Coucher, Salt Lake City, Utah, assignor to EPPCO, Salt Lake City, Utah

Filed Jan. 30, 1976, Ser. No. 653,785
Int. Cl.² B67D 5/54
U.S. Cl. 222—194 18 Claims



1. An indexing motor comprising:

a housing,

an elongated shaft journaled for rotation within said housing,

a wheel member fixed to one end of said elongated shaft, said wheel member having a plurality of spaced apart openings bored annularly about said wheel member,

a cylindrical pin loosely carried within each of said openings,

a sectored drive gear loosely held about said shaft,

a biasing means for sequentially urging each of said cylindrical pins into contact with an edge of said sectored drive gear,

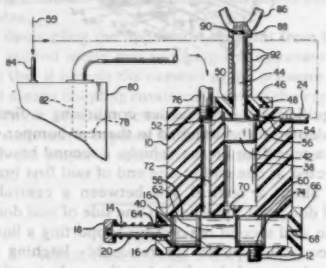
a means for intermittently moving said sectored drive gear while said cylindrical pin is in contact with said edge and,

a means for returning said sectored drive gear to its initial starting position by slidably rotating said sectored drive gear about said elongated shaft while said wheel member is held stationary.

4,006,847
DISPENSING APPARATUS

Dan W. Dooley, Lake Oswego, Oreg., assignor to Dooley Dynamics, Inc., Portland, Oreg.

Filed Oct. 23, 1975, Ser. No. 625,081
Int. Cl.² G01F *11/00*
U.S. Cl. 222—263 12 Claims



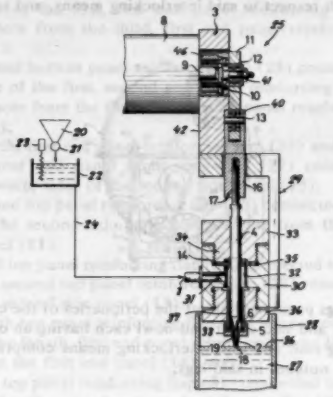
1. Dispensing apparatus comprising:
a unitary housing block provided with a bore forming a dispensing cylinder, and a dispensing exit port,
a dispensing piston received in said bore, said piston having major and minor end areas in said bore,
a second bore in said housing and a spool valve structure received therein continuously communicating with the first mentioned bore adjacent the major end of said dispensing piston,
passageways in said housing block communicating with said second bore forming ports adapted to be opened and closed by said spool valve and communicating respectively with the source of material to be dispensed and said dispensing exit port,
and means for applying air under pressure to the minor area of said dispensing piston and the material to be dispensed.

4,006,848
APPARATUS FOR PRODUCING NUCLEAR REACTOR PARTICLES

Josef Cramer, and Willi Hannen, both of Julich, Germany, assignors to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung, Julich, Germany

Filed Mar. 7, 1975, Ser. No. 556,312
Claims priority, application Germany, Mar. 12, 1974, 2411745
Int. Cl.² G01F *11/06*
U.S. Cl. 222—309 10 Claims

1. A droplet-forming device for the production of spherical fertile or nuclear fuel particles, comprising:
housing means forming an inlet for a droplet-forming liquid adapted to congeal to form said particles, a downwardly open droplet-forming nozzle, an axial passage extending from said inlet to said nozzle and coaxial therewith for delivering said liquid thereto, said nozzle having a discharge aperture of a flow cross-section less than that of said passage, and a valve seat along said passage of a flow cross-section in excess of that of said aperture;
a closure piston axially reciprocable in said passage toward and away from said seat, said piston having a conical tip receivable in and engageable with said seat;
means for periodically actuating said piston; and

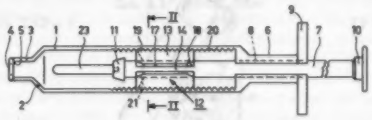


means below said nozzle for receiving said droplets and congealing same into said particles.

4,006,849
INJECTION SYRINGE HOLDER HAVING A BLOCKING MEMBER

Petrus Adrianus Wilhelmus Hendrik van Vroenhoven, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 2, 1975, Ser. No. 619,071
Claims priority, application Netherlands, Oct. 31, 1974, 7414218
Int. Cl.² A61M *5/315*
U.S. Cl. 222—309 5 Claims



1. A holder for an injection syringe, comprising a channel-shaped body having two ends, and at least sidewall portions extending longitudinally between said ends, a guide member at one end having a passage, and a shoulder at the other end, a plunger rod extending through said guide member passage into the channel-shaped body; and a blocking member arranged between and engaging said sidewall portions for longitudinal translational sliding movement, wherein a sidewall portion has teeth along an inner wall surface, and said blocking member comprises teeth engaging the teeth of the sidewall portion.

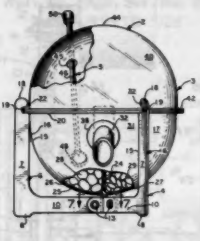
4,006,850
DISPENSING MECHANISM

John Farina, 5745 N. Washtenaw, Chicago, Ill. 60659

Filed Aug. 25, 1975, Ser. No. 607,291
Int. Cl.² G01F *11/10*
U.S. Cl. 222—356 9 Claims

1. A dispenser, comprising a container having a bowl for holding dispensible items, a transparent cover mounted over the bowl, a discharge spout extending from the interior of the bowl through an opening therein, a ladle extending through an opening in said cover and adapted to be moved to a position of accessibility to the items by rotating the cover and thereafter manipulated to scoop the items from the bowl and transfer them to the spout for discharge to a recipient, and a support stand mounting said container and comprising means for

rotatably interlocking said cover and bowl with each other and with the stand, at least said cover being formed of plastic material and being deflectible to engage and disengage said cover with respect to said interlocking means, and said stand



having legs positioned about the peripheries of the cover and the bowl, and said cover and bowl each having an outwardly projecting rim, and said interlocking means comprising rim-receiving notches in said legs.

4,006,851

NIGHT STICK HOLDER

Albert J. Kippen, Springfield, Mass., assignor to Bangor Punta Operations, Inc., Greenwich, Conn.

Continuation of Ser. No. 109,252, Jan. 25, 1971, abandoned. This application Feb. 24, 1976, Ser. No. 660,885

Int. Cl.² F41C *27/00*

U.S. Cl. 224—3 **10 Claims**

1. A holder for a night stick having a generally cylindrical handle and an enlarged diameter portion directly below the handle comprising; a sleeve formed of flexible material for receiving the body of the night stick, just below the enlarged diameter portion of the handle, said sleeve being split substantially lengthwise therealong and having generally opposed edge portions, first and second fasteners spaced axially along said sleeve with each fastener having cooperating parts carried by said opposed edge portions for releasably securing the latter one to the other thereby to selectively open and close said sleeve about the body of the stick, said first fastener being adapted to close an upper portion of said sleeve about the body of the night stick and form a sleeve diameter less than the diameter of the enlarged portion of the night stick directly below its handle thereby to substantially constrain the night stick from endwise movement axially through the sleeve in one direction, said second fastener being adapted to close a lower portion of said sleeve about the body of the night stick, said second fastener being releasable in response to an enlargement of the diameter of the lower portion of said sleeve thereby permitting quick release of the night stick from said holder after said first fastener is released, means connected to said sleeve for supporting said holder.

4,006,852

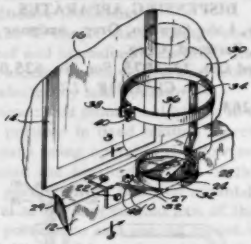
GAS TANK CARRIER FOR CAMPER OR TRAILER

Victor F. Pilsner, Rte. 1, and Merrlin M. Helmer, 219 Main St., both of Horicon, Wis. 53032

Filed Apr. 14, 1975, Ser. No. 567,903

Int. Cl.² B60R *11/00*

U.S. Cl. 224—42.03 **2 Claims**



1. A liquified gas tank carrier comprising a first bracket which is adapted to be attached to the rear bumper of a vehicle below a rear door on the vehicle, a second bracket pivotally connected at one end to one end of said first bracket and swingable about a vertical axis between a central position below said door and a position to one side of said door, means attached to said second bracket for supporting a liquified gas tank thereon, and means for releasably latching said first bracket and second bracket together when said second bracket is in its central position below said door, whereby said liquified gas tank can be supported in a central position in front of said door while said vehicle is in motion and can be swung away from said door when said vehicle is at rest to permit said door to be opened, and said first bracket comprising an angle iron having a top plate and a depending flange and wherein said second bracket has a top plate and a depending flange which tapers toward the connection with said first bracket wherein the means for supporting the tank is attached to said top plate of said second bracket and the means includes a ring for supporting the bottom of a gas tank and wherein said depending flange on said second bracket extends beneath said ring proximate a diameteral line through said ring to rigidly support said ring and the tank.

4,006,853

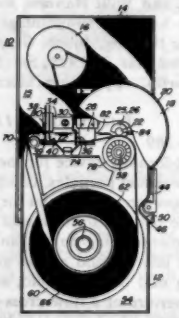
CRESCENT RESET SYSTEM FOR FAST FORWARD 8-TRACK CARTRIDGE PLAYER

Edwin Stanley Bara, Chicago, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed June 30, 1975, Ser. No. 591,674

Int. Cl.² B65H *17/22*

U.S. Cl. 226—178 **6 Claims**



1. A drive mechanism for a cartridge tape player comprising a cylindrical capstan rotatably driven about its longitudinal

axis by a motor actuated flywheel, the longitudinal axis being located in a vertical plane and pedeterminedly positioned to forcibly engage the pressure roller of a tape cartridge to be played,

a plurality of crescents vertically stacked on, and rotatable about, the capstan, each crescent having an inner face, an outer face and a vertical dimension, the inner face encircling greater than 180° of the capstan circumference while revealing a substantial arc on the capstan surface, the outer face of predetermined curvature, the vertical height predeterminedly fixed,

first means coupling the uppermost crescent to the capstan for rotation therewith in a first mode,

means coupling each crescent to the crescent beneath it in the first mode, including means aligning the crescents such that the outer faces form a substantially circular configuration as viewed from a point above the axis of the capstan,

means decoupling the uppermost crescent from the capstan in a second mode and indexing the uppermost crescent such that it reveals the capstan to the pressure roller, and

second means coupling rotational drive of the capstan to the lowermost crescent actively driving it to index at a position such that it exposes the capstan to the pressure roller when the player is activated from the first to the second mode.

4,006,854

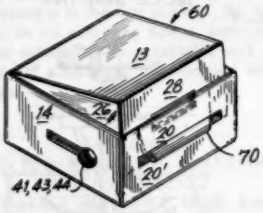
WIRE DISPENSER CONTAINER

Obediah Daniel Gibson, Duxbury, Mass., and Daniel Philip Kazes, Putnam, Conn., assignors to International Paper Company, New York, N.Y.

Filed Nov. 26, 1975, Ser. No. 635,290

Int. Cl.² B65D *5/72, 5/46*

U.S. Cl. 229—17 S **39 Claims**



1. A cut and scored, paperboard blank (10) for a hexahedronal container, having bottom, top and end walls reinforced by at least one additional layer of paperboard material, which comprises:

a bottom panel (11);

a first side pane (12) and a second side panel (13) connected to opposite sides of the bottom panel (11);

a first end panel (14) and a second end panel (15) connected to opposite sides of the first side panel (12);

a first, first end panel reinforcing flap (16) connected to a side of the first end panel (14) remote from the first side panel (12);

a first, second end panel reinforcing flap (17) connected to a side of the second end panel (15) remote from the first side panel (12);

a second, first end panel reinforcing flap (18) and a second, second end panel reinforcing flap (19) connected to the other opposite sides of the bottom panel (11);

a top panel (20) connected to a side of the first side panel (12) remote from the bottom panel (11);

a third, first end panel reinforcing flap (21) and a third, second end panel reinforcing flap (22) connected to opposite sides of the top panel (20);

a first top panel reinforcing flap (23) connected to a side of the top panel (20) remote from the the first side panel (12);

a first bottom panel reinforcing flap (24) connected to a side of the first, first end panel reinforcing flap (16) remote from the third, first end panel reinforcing flap (21);

a second bottom panel reinforcing flap (25) connected to a side of the first, second end panel reinforcing flap (17) remote from the third, second end panel reinforcing flap (22);

a fourth, first end panel reinforcing flap (26) and a fourth, second end panel reinforcing flap (27) connected to opposite sides of the second side panel (13);

a second top panel reinforcing flap (28) connected to a side of the second side panel (13) remote from the bottom panel (11);

a third top panel reinforcing flap (29) connected to a side of the second top panel reinforcing flap (28) remoted from the second side panel (13);

a fourth top panel reinforcing flap (30) connected to a side of the fourth, first end panel reinforcing flap (26) remote from the first end panel (14); and

a fifth top panel reinforcing flap (31) connected to a side of the fourth, second end panel reinforcing flap (27) remote from the second end panel (15);

the first end panel (14), the first end panel reinforcing flaps (16, 18, 21, and 26) and the fourth top panel reinforcing flap (30) being adjacent to one another; and

the second end panel (15), the second end panel reinforcing flaps (17, 19, 22 and 27) and the fifth top panel reinforcing flap (31) being adjacent to one another.

4,006,855

SEPARATOR WORM FEED AUGER AND WEAR PLATES

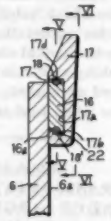
Konrad Merzenich, Hoffnungsthal, Germany, assignor to Klockner-Humboldt-Deutz Aktiengesellschaft, Germany

Filed Oct. 23, 1975, Ser. No. 625,032

Claims priority, application Germany, Oct. 23, 1975, 2450337

Int. Cl.² B04B *3/04*

U.S. Cl. 233—7 **11 Claims**



1. In a centrifugal separator having a rotating chamber, a material advancing structure within the chamber comprising:

a spirally shaped carrier vane arranged coaxially within the chamber supported on a rotatable driving shaft;

a spirally shaped wear plate supported on the vane with an edge radially outwardly of the vane and a mounting face extending radially alongside of a radial face of the carrier vane;

a mounting piece secured to said mounting face of the carrier vane;

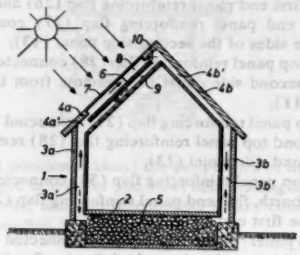
and mechanically releasable means securing said wear plate to the mounting piece so that the wear plate will not tilt on the carrier vane;

said securing means including a first locking surface on one of said carrier vane and mounting piece and a second locking surface on said wear plate, and a removable locking element between said surfaces with said locking element being removable for replacement of the wear plate.

4,006,856
ARRANGEMENT FOR UTILIZING SOLAR ENERGY FOR HEATING BUILDINGS

Karl N. A. Nilsson, Stockholm, Sweden, assignor to Aktiebolaget Svenska Flaktfabriken, Nacka, Sweden

Filed Mar. 14, 1975, Ser. No. 558,207
Claims priority, application Sweden, Mar. 27, 1974, 7404085
Int. Cl.² F24J 3/02
U.S. Cl. 237—1 A 6 Claims



1. In a building structure provided with solar heating means, comprising a solar heat-exchange chamber and air-circulating channel means extending between opposite ends of said heat-exchange chamber and communicating therewith to form a closed air-circulation loop about at least a portion of said building structure, said solar heat-exchange channel comprising a light-pervious front panel exposed to solar light and solar light-absorbing means positioned to receive solar light by way of said front panel and to convert a substantial portion of said light to heat, the improvement comprising:

means mounting said light-absorbing means to divide said heat-exhange chamber into a front channel extending between said light-absorbing means and said light-pervious front panel, and a rear by-pass channel extending between said light-absorbing means and a rear wall of said heat-exchange chamber; and

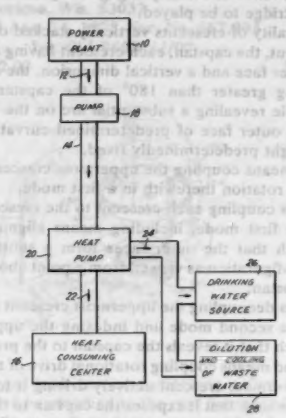
air-flow responsive check valve means associated with said front channel for automatically reducing the air flow through said front channel when the solar heat-producing radiations reaching said solar light absorbing means are strongly reduced or absent, and for permitting said air flow to increase when said radiation increases.

4,006,857
METHOD FOR TRANSPORTATION AND UTILIZATION OF WASTE HEAT OF LARGE CONDENSER POWER PLANTS

Fritz Adrian, Ratingen, Germany, assignor to Deutsche Babcock & Wilcox Aktiengesellschaft, Oberhausen, Germany

Filed Sept. 2, 1975, Ser. No. 609,400
Claims priority, application Germany, Dec. 21, 1974, 2460829
Int. Cl.² F24D 9/00, 11/02
U.S. Cl. 237—2 B 6 Claims

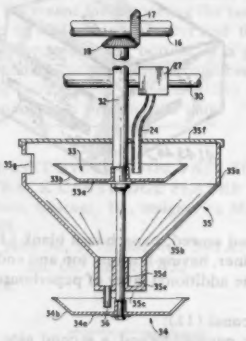
1. A method for transporting heat over long distances, utilizing the waste heat of thermal power plants comprising the steps of: increasing the condenser back-pressure at a power plant to a level at which the condenser cooling water attains a temperature within the range of 25°–50° C; the temperature of said cooling water being limited within the range of 25°–50° C; pumping the cooling water through substantially large pipelines to a location remote and at a substantially far distance from said power plant for using the heat in the cooling water for consumer purposes; the temperature of said cooling water being limited within the range of 25°–50° C for substantially minimizing loss of heat from said pipelines while said cooling water is pumped through said pipelines; applying the condenser water to a heat pump and raising the temperature of a heating medium by the heat content in said condenser water, the temperature of said heating medium being raised to a level at which the heat transferred from the condenser water to the heating medium is usable for heating purposes at said location.



4,006,858
SPRAY APPARATUS

Horstine Farmery, North Newbald, England, assignor to Horstine Farmery Limited, North Newbald, England

Filed Feb. 17, 1976, Ser. No. 658,841
Claims priority, application United Kingdom, Feb. 27, 1975, 8300/75
Int. Cl.² B05B 1/28
U.S. Cl. 239—7 15 Claims



1. A method for distributing a flowable material over a base surface comprising the steps of rotating two rotary members in vertically spaced relationship about a common vertical axis, centrifuging flowable material from the upper one of said rotary members to obtain a substantially annular spray pattern from said upper rotary member, interrupting the annular spray pattern from the upper one of said rotary members at two locations spaced apart but concentric with the rotational axis of the said rotary members whereby to reduce the said annular spray pattern to two separated arcuate spray patterns, directing the interrupted material from the annular spray pattern to the lower one of said rotary members and centrifuging said material from said lower rotary member to obtain an annular spray pattern therefrom, and whereby the two arcuate spray patterns produced from the upper one of said rotary member is superimposed on the annular spray pattern from the lower one of said rotary members.

4,006,859

FUEL INJECTION NOZZLE FOR INTERNAL COMBUSTION ENGINES

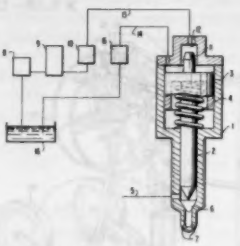
Frank Thoma, Stuttgart, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Aug. 27, 1975, Ser. No. 608,345

Claims priority, application Germany, Aug. 31, 1974, 2441841

Int. Cl.² B05B 1/30

U.S. Cl. 239—89 11 Claims



1. A fuel injection nozzle for internal combustion engines which comprises a nozzle needle means displaceably guided in a nozzle body means, the nozzle needle means being operable to feed fuel, metered by a metering means, under pressure to a combustion space by way of at least one injection bore means, the nozzle means being displaceably guided from a first position spaced from the bore means to a second position sealing the bore means and terminating the injection, characterized in that a pressure space means communicating with the metering means is provided for accommodating the fuel to be injected, said pressure space means is defined between the injection bore means and the nozzle needle means when said nozzle needle means is in the first position, the nozzle needle means includes on its actuating side a servo-piston means which is guided intermittently actuatable and displaceable against the force of a spring in the injection direction by a pressure medium.

4,006,860

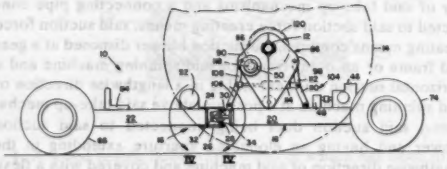
METHOD AND APPARATUS FOR TRANSPORTING AN IRRIGATION LINE

Gail Cornelius, Portland, and Lloyd C. Olson, Beaverton, both of Oreg., assignors to R. M. Wade & Co., Portland, Oreg.

Filed June 12, 1975, Ser. No. 586,419

Int. Cl.² B05B 3/02

U.S. Cl. 239—212 47 Claims



1. Apparatus for transporting an irrigation line supported by and having fixed relative thereto a plurality of wheel means and transportable upon rotation thereof about the longitudinal axis thereof comprising:

a transport assembly movable to adjacent a continuous irrigation line inwardly of a wheel means most adjacent an end of an irrigation line;

readily attachable means associated with said transport assembly for selectively applying rotational torque to a continuous irrigation line at an area inwardly of a wheel means most adjacent an end of that irrigation line, with the transport assembly adjacent the irrigation line, to rotate the adjacent irrigation line about the longitudinal axis thereof; and

means associated with the transport assembly for allowing removal of the transport assembly from a transported irrigation line.

4,006,861

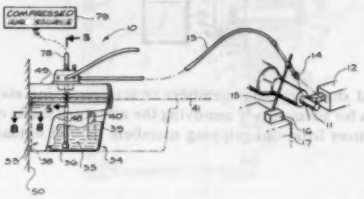
MACHINE TOOL COOLANT APPARATUS

Shirl R. Alger, Rowland Heights; Ronald S. Arnold, Brea, and Manfred Schuler, Newport Beach, all of Calif., assignors to All-Power Manufacturing Co., Montebello, Calif.

Filed Feb. 12, 1976, Ser. No. 657,448

Int. Cl.² B05B 1/30, 7/24

U.S. Cl. 239—311 23 Claims



1. Mist coolant apparatus comprising:

a container for holding a quantity of coolant liquid;

at least one flexible hose through which liquid from said container and a compressed gas flow and having a discharge nozzle for emitting a spray of said coolant onto a work piece; and

a liquid distribution unit for delivering the liquid to said hose;

said liquid distribution unit including a centerpost containing passages into which liquid from said container and said compressed gas flow in isolation from one another, a body structure disposed about said centerpost and having a plurality of outlet openings at different locations spaced apart circularly about the centerpost and adapted for connection to a plurality of said hoses to deliver liquid and gas thereto, with said body structure containing passages leading liquid and compressed gas from the centerpost separately to said outlets, and valve means for controlling the flow of compressed gas from the centerpost to at least one of said outlets.

4,006,862

ARMATURE WINDING APPARATUS WITH IMPROVED ARMATURE LOADING AND UNLOADING MECHANISM

Lawrence A. Shively, Dayton; Robert C. Gray, Tipp City, and Robert P. Hoy, Springfield, all of Ohio, assignors to Mechaneer, Inc., Dayton, Ohio

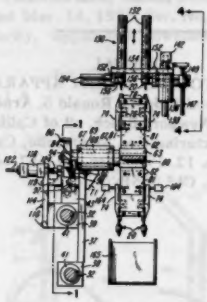
Filed Dec. 20, 1974, Ser. No. 534,911

Int. Cl.² B65G 29/00; H02K 15/09

U.S. Cl. 242—7.05 B 15 Claims

1. Apparatus for successively winding armatures each having an armature core and a commutator mounted on an armature shaft, comprising a set of opposing chucks positioned at an armature winding station and having means for gripping the core of each armature, means including a rotatable flyer for winding wire coils on said armature core at said winding station, a turret having a plurality of angularly disposed armature shaft gripping members, means supporting said turret for rotary indexing on a generally horizontal axis in a step-by-step manner, each of said shaft gripping members having means for releasably gripping an end portion of each armature shaft with the armature projecting in a cantilever manner outwardly from said gripping member, means for moving said turret for successively transferring each said gripping member and the corresponding armature from an armature receiving station to

a circumferentially spaced armature unloading station through said armature winding station, means for successively supplying unwound armatures and their corresponding shafts



to said shaft gripping members at said receiving staton, and means for successively removing the armature shafts of wound armatures from sad gripping members at said unloading station.

4,006,863

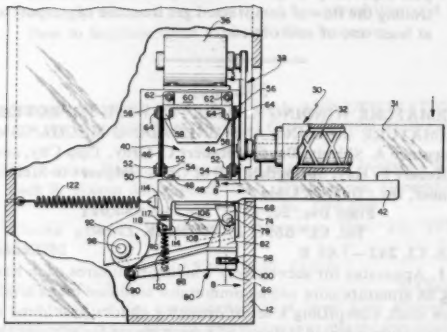
STRAND SCATTERING WINDING MACHINE

William Malcolm Bense, Barrington, R.I., assignor to Leesona Corporation, Warwick, R.I.

Filed Oct. 6, 1975, Ser. No. 620,172

Int. Cl.² B65H *54/38*

U.S. Cl. 242—18.1 **8 Claims**



1. Apparatus for winding a strand onto a rotating member to form a package comprising a frame member, a beam, means mounted on said beam for traversing said strand axially of said member to form a plurality of overlying layers of said strand, a pair of spaced leaf springs respectively interconnected at opposed ends thereof to said frame and said beam to mount said beam to said frame, said mounting means permitting transverse flexure of said beam relative to said frame, and means for oscillating said beam to vary the relative axial position of the traversal strokes of said strand.

4,006,864

METHOD AND APPARATUS FOR CARRYING OUT DOFFING AND DONNING OPERATION

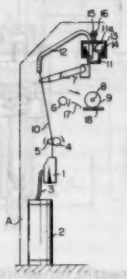
Takuzo Tooka, Toyoake, Japan, assignor to Daiwa Boseki Kabushiki Kaisha, Osaka and Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, both of, Japan

Filed Nov. 21, 1974, Ser. No. 525,848

Claims priority, application Japan, Nov. 27, 1973, 48-133770; Nov. 27, 1973, 48-133771

Int. Cl.² B65H *67/04*

U.S. Cl. 242—35.5 R **3 Claims**



1. In an apparatus for carrying out doffing and donning operations at each unit of a spinning machine, means for continuously delivering a yarn from said spinning unit, and a take-up mechanism provided with a friction roller and a cradle for rotatably supporting a fresh bobbin or a yarn package formed on said bobbin in contacting relationship with said friction roller, said cradle being pivotally supported on a shaft mounted on a bracket secured to a frame of said units, means for releasably and rotatably holding a bobbin on said cradle, said holding means being disposed on said cradle, suction means disposed at a position on the opposite side of said delivery means with respect to said friction roller for temporarily forming a yarn passage by a yarn continuously being delivered from said delivery means at a position in front of the part of the peripheral surface of said friction roller where said yarn passes over during a normal taking up operation, the improvement comprising means for displacing said suction means in a direction lengthwise of said spinning machine to a position outside and above said take-up mechanism of each spinning unit at the time of doffing and donning operations, and means for creating suction force in said suction means, said displacing means comprising means for temporarily stopping said suction means at any point lengthwise of said spinning units, said suction means comprising a suction nozzle provided with a mouth opened at a position outside and above any of said take-up mechanisms and a connecting pipe connected to said suction force creating means, said suction force creating means comprising a suction blower disposed at a gear end frame or an outer frame of said spinning machine and a horizontal suction duct extending in a lengthwise direction of said spinning machine at a position above said take-up mechanisms, said suction duct being connected to said suction blower and having an elongated aperture extending in the lengthwise direction of said machine and covered with a flexible plate, said connecting pipe of said suction nozzle displaceably extending into said duct through said aperture, in a condition such that said flexible cover plate seals said aperture of said suction duct other than at the portion of said aperture through which said connecting pipe of said suction nozzle extends, said displacing means comprising an endless belt extending lengthwise of said spinning machine at a position above said take-up mechanisms, and driving pulley and a guide pulley respectively disposed at the end frames of said spinning machine, and a motor for driving said driving pulley, said endless belt being held by said pulleys, a guide rail means disposed along said suction duct, a carrying member displace-

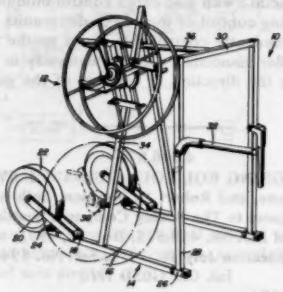
ably mounted on said guide rail, and an engaging member for detachably engaging said endless belt with said carrying member, said connecting pipe being held by said carrying member for movement lengthwise of said machine.

4,006,865

ADJUSTABLE WIRE DISPENSING REELS AND BASE FOR USE IN DISPENSING BOX WIRE

Ansel W. Howard, 1301 W. Tenth, Coffeyville, Kans. 67337

Filed Oct. 7, 1975, Ser. No. 620,361
Int. Cl.² B65H *17/46*
U.S. Cl. 242—86.5 R **9 Claims**



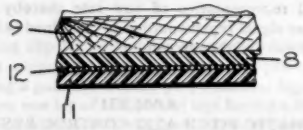
1. A wire dispensing device, comprising a mobile carrier and a plurality of reel assemblies, each of said reel assemblies including a pair of wheels each having radially inner and outer rims interconnected by radial spokes, an adjustable hub assembly rotatably mounted on the carrier and interconnecting the pair of wheels in axially adjusted relation to each other, handle means connected to the hub assembly for holding the wheels assembled on the hub assembly and imparting rotation to the reel assembly, and releasable locking means for holding the hub assembly in a radially adjusted position relative to the wheels.

4,006,866

ACRYLIC MODIFIED URETHANE BOBBIN FINISH

Walter C. Webster, III, Northbridge, and Frank L. Allen, Jr., Hopedale, both of Mass., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Division of Ser. No. 573,863, May 2, 1975. This application Jan. 29, 1976, Ser. No. 653,558
Int. Cl.² B65H *75/12;* **B32B** *27/40*
U.S. Cl. 242—118.32 **6 Claims**



1. A wood textile bobbin the wood of which has been dried to less than about 9% by weight of moisture, said bobbin comprising;

a. a wood bobbin body;

b. a first protective layer adherent directly to and penetrating the exposed surface of said bobbin body said first coating consisting essentially of ricinoleate diphenyl methane diisocyanate prepolymer and trifunctional polyether polyol;

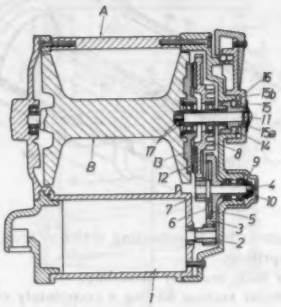
c. a second protective layer adherent directly to said first protective layer, said second protective coating consisting essentially of ricinoleate diphenyl methane diisocyanate prepolymer and trifunctional polyether polyol modified with 30% to 50% thermoplastic acrylic copolymer.

4,006,867

MOTORIZED FISHING REEL WITH CLUTCHES

Toshiaki Miyamae, 2-16, 2-chome, Nishi-Iwata, Higashi-Osaka, Osaka, Japan

Filed Aug. 20, 1975, Ser. No. 606,216
Int. Cl.² A01K *89/017, 89/02*
U.S. Cl. 242—217 **1 Claim**



1. A motorized fishing reel comprising

a reel frame;

a torque motor housed in said frame;

a power transmission means including a pinion connected to said motor for transmitting rotary power from said motor;

a first shaft held by said frame;

reduction gear means freely rotatable about said first shaft and engageable with said pinion;

a first lining attached to one side of said reduction gear;

first clutch means including first clutch plate frictionally contactable with said first lining of said reduction gear;

reduction pinion means freely rotatable about one end of said first shaft and attached to said first clutch plate;

dished head spring held by said first shaft exerting pressure from the other side of said reduction gear;

nut means held by first shaft for manually adjusting the frictional engagement of said reduction gear with said first clutch plate by regulating the pressure of said dished head spring acting against said reduction gear;

a second shaft held by said frame;

main gear means freely rotatable about said second shaft and engagable with said reduction pinion;

a second lining attached to one side of said main gear;

a second clutch plate freely rotatable about said second shaft and mounted adjacent said second lining and frictionally contactable therewith;

second dished head spring mounted on said second shaft and contactable with the other side of said main gear;

cam means mounted on said second shaft, including a cylindrical cam member having a convex surface and a cylindrical cam member having a concave surface slidably engagable with one another;

manual control lever for slidably engaging said convex member with said concave member thereby to forcibly press said second dished head spring against said main gear thereby frictionally engaging said second lining with said main gear;

a third shaft held by said frame; and

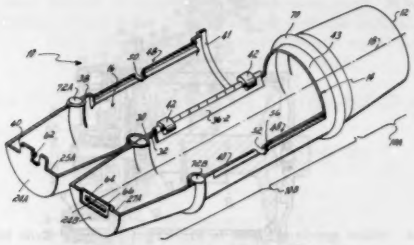
spool means supported at end end by said second shaft and at the other end by said third shaft.

4,006,868

CARRIER FOR PNEUMATIC TUBE SYSTEM

Ernest Hochradel, Sparta; Werner Hauer, Nutley, and Victor J. Vogel, Oak Ridge, all of N.J., assignors to The Mosler Safe Company, Hamilton, Ohio

Filed July 28, 1975, Ser. No. 599,368
Int. Cl.² B65G *51/06*
U.S. Cl. 243—34 **13 Claims**



1. A carrier for transporting articles through a pneumatic tube comprising:

a major body member including,

a. a tubular section having a completely closed outer end and a completely open inner end,

b. a first semi-tubular section having a completely open inner end integrally connected to said tubular section inner end, an outer end, and a pair of side edges,

a minor body member having a second semi-tubular section with a completely open inner end, an outer end, and a pair of side edges,

a connector pivotally interconnecting one of said side edges of said first semi-tubular section and one of said side edges of said second semi-tubular section for facilitating movement of said semi-tubular sections between a) a closed position in which both said semi-tubular sections cooperate to define an enclosed tubular region, and b) an open position in which semi-tubular sections are juxtaposed,

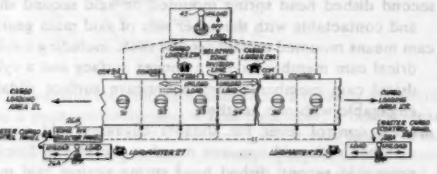
end closure means integrally connected to at least one of said outer ends of said semi-tubular sections to seal said outer ends of said semi-tubular sections when positioned in said closed position, at least part of said end closure means being connected for movement with said outer end of said second semi-tubular section to provide endwise access to the interior of said tubular section when said semi-tubular sections are positioned in said open position.

4,006,869

CARGO HANDLING SYSTEM

Bruno Joseph Vogele, Kirkland, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed June 30, 1975, Ser. No. 591,785
Int. Cl.² B64D *9/00*; B64C *1/20*
U.S. Cl. 244—137 R **7 Claims**



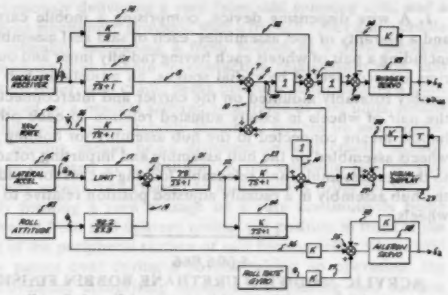
1. A cargo handling control system, for permitting simultaneous loading and unloading of cargo through two entryways of a single cargo compartment, comprising; a first master controller for controlling cargo through a first entryway; a second master controller for controlling cargo through a second entryway remotely located with respect to the first entryway; a multiplicity of power drive units on the floor of the cargo compartment for moving cargo between the entryways; a cargo control module directly associated with each of the individuals power drive units; a zone division logic operatively interconnected between said cargo control module and the master controllers for permitting the arbitrary selection of a zone division line between any adjacent pair of power drive units to automatically set up two cargo control zones, one on either side of the arbitrarily selected zone division line, with each of said zones being controllable independently of each other by only one of the master controllers; said zone division logic in conjunction with said cargo control module, delegating the operating control of the power drive units in each of the two independently controllable zones to the respective master controller associated with the entryway in that zone, for controlling the direction of rotation of the power drive units.

4,006,870

SELF-ALIGNING ROLL OUT GUIDANCE SYSTEM

Jimmie H. Boone, and Robert D. Simpson, both of Bellevue, Wash., assignors to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 428,515, Dec. 26, 1973, abandoned. This application July 10, 1975, Ser. No. 594,833
Int. Cl.² G05D *1/12*
U.S. Cl. 244—184 **7 Claims**



1. In combination in an aircraft control system for controlling the path of the aircraft along the surface of a runway;

first means comprising lateral velocity signal generating means;

second means comprising yaw rate signal generating means;

third means comprising adder circuit means for combining said signal representative of lateral velocity and said signal representative of yaw rate thereby providing a further signal representative of combined skid and lateral movement of the aircraft.

4,006,871

AUTOMATIC PITCH AXIS CONTROL SYSTEM FOR AIRCRAFT

Robert D. Simpson, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 264,119, June 19, 1972, abandoned. This application Jan. 18, 1974, Ser. No. 434,538
Int. Cl.² G05D *1/12*
U.S. Cl. 244—186 **10 Claims**

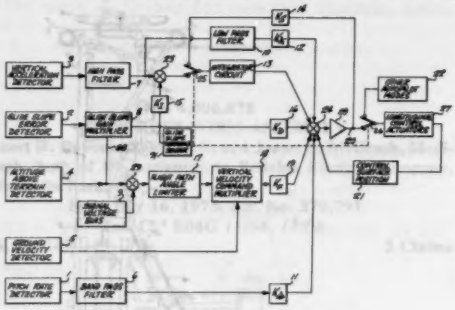
1. In combination in a pitch axis control system, means for achieving short term stability of an aircraft comprising:

first means for generating a first signal representative of the change in vertical velocity of said aircraft;

second means for generating a second signal representative of vertical acceleration of said aircraft;

third means for generating a third signal representative of pitch rate of said aircraft;

fourth means for combining said first, second, and third signals; and



fifth means including longitudinal control actuator means coupled between said fourth means and the control surfaces of said aircraft.

4,006,872

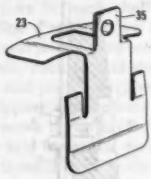
ELECTRICAL CONNECTOR ASSEMBLY

Robert Ivins Tanner, Columbus, Ohio, assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 23, 1976, Ser. No. 660,417

Int. Cl.² G12B *9/08*; H02B *104*

U.S. Cl. 248—27.1 **1 Claim**



1. A locking clip for removably securing a housing in an opening in a supporting mounting plate comprising a neck portion having a pair of mutually perpendicular legs, a flange extending from one leg of said pair of legs having a first pair of spring ends extending outwardly from respective sides of said one leg, each of said first pair of spring ends being deflected from the plane of said flange in the direction of the other leg of said pair of legs, and a blade portion extending from said other leg, said blade portion being formed to present a pair of shoulders extending at right angles outwardly from respective sides of said other leg, said shoulders being disjoined from said other leg for a partial length of said blade portion to present a second pair of spring ends, each of said second pair of spring ends being deflected from the plane of said blade portion in the direction of said one leg of said pair of legs, the ends of said first pair of spring ends and the ends of said second pair of spring ends being spaced apart a predetermined dimension, said first and second pairs of spring ends being flexible to grip therebetween a mounting plate having a thickness greater than said predetermined dimension.

4,006,873

SPRING SUPPORT

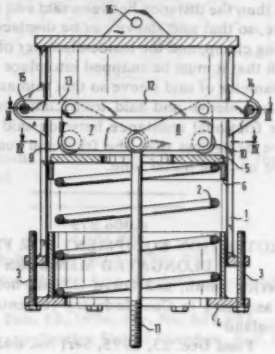
Peter Berger, Pforzheim, Germany, assignor to Metallschlauch-Fabrik Pforzheim (vorm. Hch. Witzenmann) Gesellschaft mit beschrankter Haftung, Pforzheim, Germany

Filed Apr. 11, 1975, Ser. No. 567,085

Claims priority, application Germany, Apr. 11, 1974, 2417728

Int. Cl.² F16L *3/00*

U.S. Cl. 248—54 CS **14 Claims**



1. In a spring support device including a coil spring having a longitudinal axis, one end supported by a stationary abutment and another end carrying a spring disc; at least two bell crank levers arranged on the spring disc symmetrically to the coil spring; fulcrum means slidably and pivotally supporting each bell crank lever on the spring disc; each bell crank lever having a first arm extending from the fulcrum means generally towards the axis of the coil spring; each bell crank lever having a second arm extending from the fulcrum means at an angle to the first arm; the first and second arms having an end remote from the fulcrum means; a longitudinally movable pull rod having a first end adapted to carry a load and a second end at least indirectly articulated to the end of each first arm; the improvement comprising guiding means for guiding said end of each said second arm in a stationary, arcuate path oriented generally along a line parallel to said axis.

4,006,874

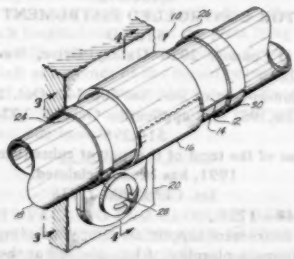
TUBE CLAMP

James Monroe McGee, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sept. 29, 1975, Ser. No. 617,925

Int. Cl.² F16L *3/08*

U.S. Cl. 248—74 R **2 Claims**



1. Clamping apparatus for supporting a metal tube from fixed structure, the apparatus comprising a split sleeve surrounding the tube, said sleeve having identical, interlocking halves, interlocking tongues and slots and raised shoulders at

their ends, and a loop clamp surrounding the split sleeve between the end shoulders and attached to the fixed structure, the improvement comprising having the interlocking tongues extending cylindrically from the interlocking halves and cylindrically surrounding more than 180° of the tube circumference so that the sleeve halves must be snapped into place to be installed onto the tube and so that axial displacement of said sleeve along said tube is frictionally resisted by the spring clamp action of each part of said split sleeve said improvement further comprising the width of said strap of said loop clamp being less than the distance between said end shoulders of said split sleeve, so that said sleeve can be displaced axially in said surrounding clamp, and the inside diameter of said loop clamp being such that it must be snapped into place to fit around the outside diameter of said sleeve so that said axial displacement between said sleeve and said loop clamp is frictionally resisted, the frictional resistance between said loop clamp and said sleeve being less than the frictional resistance between said sleeve and the metal tube.

4,006,875

PROTECTION EQUIPMENT FOR FLEXIBLE ELONGATED MEMBERS

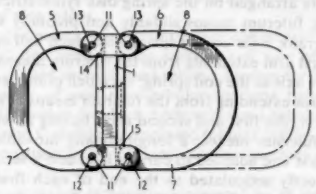
Job Frederick Smith, and Owen O'Neill, both of Derby, England, assignors to Coal Industry (Patents) Limited, London, England

Filed Dec. 23, 1975, Ser. No. 643,916

Claims priority, application United Kingdom, Jan. 3, 1975, 262/75

Int. Cl.² A62C *23/04*; A41B *21/00*; F16G *13/00*

U.S. Cl. 248—75 **4 Claims**



1. Protection equipment for a plurality of flexible elongated members, comprising a link having a support component adapted to be pivotally connected adjacent its ends to two other support components of adjacent links, respectively, and two retaining components securable to opposed sides of the support component, respectively, to define two closed-sided passages extendable around the flexible elongated members which in use pass through the passages.

4,006,876

ACTUATOR CONTROLLED INSTRUMENT SUPPORT STAND

Chadwell O'Connor, 2024 Galaxy Drive, Newport Beach, Calif. 92660

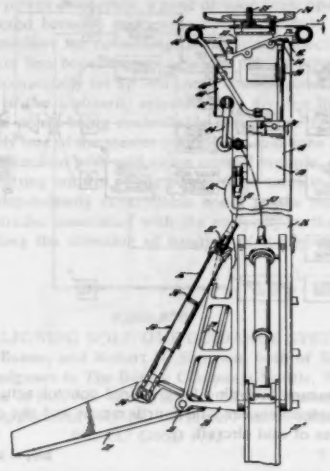
Continuation-in-part of Ser. No. 406,542, Oct. 15, 1973, Pat. No. 3,850,395. This application Oct. 15, 1974, Ser. No. 514,298

The portion of the term of this patent subsequent to Nov. 26, 1991, has been disclaimed.

Int. Cl.² F16M *11/38*

U.S. Cl. 248—171 **2 Claims**

1. In an instrument support structure including, in combination, a column, a plurality of legs pivoted at the lower end of said column for swinging movement between positions adjacent the column to positions extending from the column to define a base for supporting the column upright, a plurality of struts including double-acting fluid actuators each connected between said column and one of said legs so as to define one extendible strut for each of the legs, a reservoir mounted on said column and containing fluid, and means including a valve for selectively (1) opening said reservoir to all of said actuators so that, when so opened, the struts extend and the legs pivot to their base defining positions, (2) shutting off said



reservoir while allowing intercommunication of fluid between the actuators, and (3) shutting off intercommunication of fluid between the individual actuators and between the reservoir and both ends of said double-acting actuators so as to lock said struts against both tension and compression loads.

4,006,877

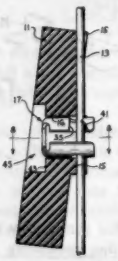
BICYCLE REFLECTOR CLIP

Clarence R. Van Niel, North Olmsted, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Filed May 27, 1976, Ser. No. 690,349

Int. Cl.² F16M *13/00*

U.S. Cl. 248—466 **12 Claims**



1. A one-piece spring clip for mounting a first member fixed relative to an elongated second member, the first member having an aperture extending therethrough defining an axis, the axis intersecting the elongated second member and being generally perpendicular thereto, said spring clip comprising:

a. a generally tubular body portion having a head end and an opposite end and adapted to be disposed within the aperture of the first member;

b. said body portion defining first and second oppositely-disposed slots extending axially from said opposite end;

c. said body portion defining first and second oppositely-disposed slots extending circumferentially from said first and second axial slots, respectively, each of said circumferential slots having a terminal portion contiguous therewith and adapted to receive said elongated member extending therethrough;

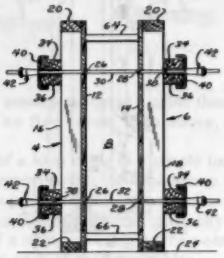
d. said tubular body portion defining a distance X from said circumferential slot to said head end and a distance Y from said terminal portion to said head end, both of said distances X and Y being less than the thickness of the first member adjacent the aperture.

4,006,878

CONCRETE FORM ASSEMBLY

Robert H. Dawson, Lake Bluff, and James L. McGrath, Medinah, both of Ill., assignors to Reliable Electric Company, Franklin Park, Ill.

Filed July 16, 1973, Ser. No. 379,791
Int. Cl.² E04G *11/08, 17/08*
U.S. Cl. 249—43 **5 Claims**



1. A concrete form assembly comprising spaced apart forms, spacers spanning the space between said forms and establishing a preselected distance therebetween, said forms having holes positioned such that holes in one form are aligned with holes in the other form, plastic tie rods spanning the space between said forms and projecting through pairs of said aligned holes, and anchors on the outsides of said forms and receiving said rods, said anchors each including a tapered shell having a smaller end presented toward the adjacent form and abutting an appurtenant portion thereof; a plurality of arcuate tapered jaws in each shell that are longitudinally juxtaposed to define a tapered jaw cluster with a bore that receives the rods, said jaws having teeth presented to said bore for gripping the rod, each of said shells having spring means therein that urges said jaw cluster therein toward the adjacent form and into gripping engagement with the rod such that forces tending to move the forms further apart upon pouring concrete between said forms act on said shells at the respective smaller ends thereof to increase the grip on said rod by said jaw teeth and thereby maintain said preselected distance despite said forces, said tie rods being of such size, crosssection and composition as to be manually breakable, and said anchors being exposed for manual gripping and movement with the smaller ends thereof fulcruming on the appurtenant portions of the forms to break off the tie rods adjacent to and exteriorly of said forms.

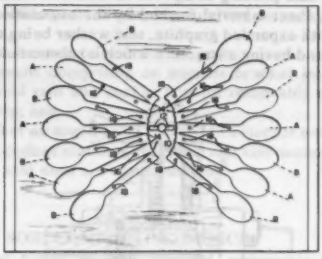
4,006,879

DEGATING

Peter J. Morroni, P.O. Box 1102, Marco Island, Fla. 33937

Filed Apr. 22, 1976, Ser. No. 679,478
Int. Cl.² B29F *1/14*
U.S. Cl. 249—68 **8 Claims**

1. In a die for molding articles, cavities arranged with communication between contiguous cavities forming means for the running of molten plastic material so that when cooled a variety of parts are connected together into a single shot, means for ejecting alternate articles from the die, thereby disrupting all the articles from each other and thereby degating them, and second ejection means for ejecting the remainder of the articles.

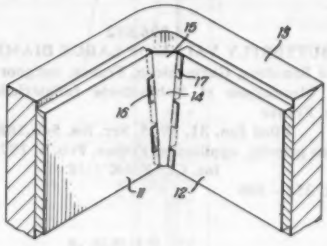


4,006,880

SIDE BOARD SECURING DEVICE

Raymond Snowdon, Long Acre Nechells, Birmingham, B7 5JR, England

Filed Feb. 13, 1976, Ser. No. 657,902
Claims priority, application United Kingdom, Feb. 18, 1975, 6803/75
Int. Cl.² B22D *7/10*
U.S. Cl. 249—106 **8 Claims**



1. In a securing device for use in securing two side boards together in a hot top assembly for an ingot mould, each side board having an inner surface and an end surface, the securing device constituted by a single plate which tapers in width along its length, the improvement which comprises at each of the longitudinal edges of the plate an integral marginal portion which is divided transversely to provide at least a first and a second flange, each flange extending over only part of the length of the plate, one of said flanges projecting at an acute angle forwardly from the plate, and the other of said flanges projecting at an acute angle rearwardly from the plate, the flanges at each longitudinal edge of the plate lying at such an angle to one another that when the securing device is inserted into the gap left at a corner of the mould between two of the side boards of the hot top assembly, the said flanges will respectively engage the inner surface and the end surface of one of the said two side boards.

4,006,881

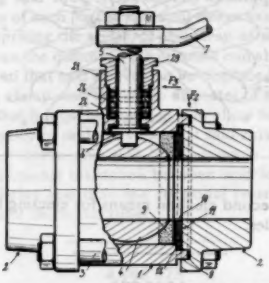
FLUID-TIGHT PACKING FOR CLOSURE DEVICES AND DEVICES FITTED WITH SAID PACKING

Georges Gaillard, Montmorency, France, assignor to Gachot S.A., Soisy-sous-Montmorency, France

Filed Dec. 9, 1974, Ser. No. 530,556
Int. Cl.² F16K *41/00*
U.S. Cl. 251—214 **4 Claims**

1. A closure device such as a valve or cock which is primar-

ily intended to withstand high temperatures, comprising a plug actuated by a rod moving across a stuffing-box packing, wherein said packing comprises at least one washer of carbonaceous sheet material formed by the association of carbon fibers with expanded graphite, said washer being cut out from a sheet and having a structure which is substantially laminated



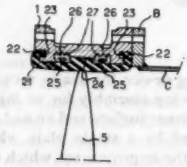
in a direction parallel to the plane of the sheet from which the washer is cut out, said washer being clamped by a gland nut of said stuffing-box between two metallic washers each having a convex bearing surface and said washer being compacted as a result of the compression applied transversely to the plane of the sheet material.

4,006,882

BUTTERFLY VALVE OF LARGE DIAMETER

Maurice Bonafous, Gurmenicon, France, assignor to Applications Mecaniques et Robinetterie Industrielle A.M.R.I., Paris, France

Filed Jan. 31, 1975, Ser. No. 546,188
Claims priority, application France, Feb. 6, 1974, 74.03970
Int. Cl.² F16K 1/18
U.S. Cl. 251—306 **3 Claims**



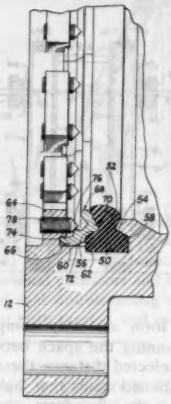
1. A butterfly valve of large diameter, comprising: a cylindrical body having a substantially cylindrical inner bore defined at its outer ends by spaced-apart parallel side walls and being lined in its interior with an elastic seat in the form of a ring that terminates at said parallel side walls of said valve body; said ring having a substantially U-shaped cross-section that conforms to the configuration of said bore; a butterfly pivotally mounted in said body by means of valve spindles that pass through said body and said ring; wherein said body includes at least two annular grooves, each of which having an opening at its innermost end into said bore, and being closed at its outermost end; said grooves being coaxial with respect to said bore, opening thereinto, and being narrower at said innermost ends than at said outermost ends; said ring being constructed of a plurality of sections that are disposed in an end-to-end relationship, said sections including two sections having a curvilinear outer shape for the passage of said valve spindles and of the valve, and a plurality of rectilinear sections; the ends of said sections being formed and vulcanized to shape after having been aligned with each other; said ring further including, on its side adjacent said body, at least two annular tenons that have heads which respectively engage said grooves; said tenons being smaller than said openings of the grooves; and wherein an empty space is provided between said tenons and said grooves, said empty space being filled with a plastic material that hardens by polymerization, to retain said ring in said body.

4,006,883

ADJUSTABLE SEAT FOR BUTTERFLY VALVES

George W. Hilsheimer, P.O. Box 1647, Tulsa, Okla. 74101

Filed Jan. 8, 1973, Ser. No. 321,994
Int. Cl.² F16K 1/22
U.S. Cl. 251—307 **6 Claims**



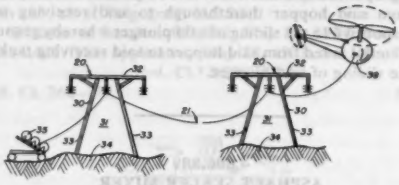
1. A valve seat for a butterfly valve having a valve body and a valve disc rotatable to alternate open and closed positions, comprising a first annular groove provided in the valve body in substantial alignment with the closed position of the valve disc, a resilient valve seat disposed within said annular groove and having the outer periphery thereof in sealing engagement with the groove and the inner periphery thereof in sealing engagement with the outer periphery of the valve disc in the closed position thereof, said valve seat being provided with oppositely disposed annular recesses, one sidewall of said annular groove being provided with recess means complementary to the recess means of the valve seat disposed adjacent thereto, a second annular groove provided in the valve body and in open communication with the first annular groove, inwardly directed flange means provided on the body conterminous with the second annular groove and spaced from the first annular groove, a plurality of arcuate retaining segments disposed in end to end relation within said second annular groove between the flange means and valve seat means, said arcuate retaining segments being provided with longitudinally extending ridge means along one side thereof of a configuration complementary to the recess of the valve seat disposed thereagainst, a longitudinally extending curved sidewall provided on each retaining segment conterminous with the ridge and engagable with the second annular groove whereby said retaining segments are pivotally disposed therein, projection means provided on each retaining segment oppositely disposed with respect to the curved sidewall, and adjusting means provided on said lug means and engagable with the projection means for selectively rocking the retaining segments in a direction toward the valve seat, said ridge of each retaining segment cooperating with the recess of the sidewall of the first annular groove for selectively adjusting the sealing pressure of the valve seat against the outer periphery of the valve disc upon rocking of the segments by said adjusting means.

4,006,884

METHOD AND APPARATUS FOR AERIAL WIRE STRINGING THROUGH AREAS WITHOUT VERTICAL ACCESS

Donald A. Lederhos, Rte. 1, Box 498, Bonners Ferry, Idaho 83805, and L. E. Lindsey, 222 Vista Ave., Pasadena, Calif. 91107

Filed Sept. 22, 1975, Ser. No. 615,480
Int. Cl.² B66D 1/36
U.S. Cl. 254—134.3 PA 8 Claims



1. A method of aerially stringing a cable through an area of a support having no free access from above, comprising, in combination:

the placement of a loop cable in a simple loop through the area of the support having no access from above with the ends of the loop cable extending to a releasable support in an area having free access from vertically above;

the transport of a stringing cable to the point of releasable support of the ends of the loop cable;

the interconnection of the loop cable in the pulling cable to form a compound unitary pulling cable; and

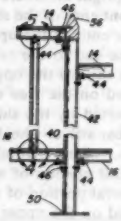
the release of the ends of the loop cable from their releasable support.

4,006,885

MODULAR FENCE AND HAND RAIL

Jose Unterberger, 2562 Runyon, Anaheim, Calif. 92804

Filed Dec. 5, 1975, Ser. No. 638,145
Int. Cl.² E04H 17/14
U.S. Cl. 256—59 2 Claims



1. A modular fence and hand rail comprising:

a first upper, elongated, tubular rail member having a plurality of equally-spaced, threaded holes juxtapositioned along one side thereof;

a second, lower, support rail positioned in parallel relationship to said first rail, said second rail being an elongated tubular member having a plurality of oppositely aligned holes disposed therein in a juxtaposed relation;

a plurality of vertical, tubular bar members, wherein each bar includes;

a threaded screw secured to the upper end of said bar wherein said screw is arranged to be received in said threaded holes of said first rail member;

a threaded plug being removably attached to the lower end of said bar;

a mounting bolt adapted to pass through said aligned holes of said second rail, and threadably engage said threaded plug in said vertical bar;

a pair of anchor posts removably mounted to each end of said rails;

a base plate secured to said anchor post;

attached means comprising an angular bracket interconnecting said rails and anchor post for removably mounting thereto; and

a cap member arranged to be secured to adjacent terminating open ends of said first upper rail and said anchor post, whereby said ends are closed thereby.

4,006,886

SOIL COMPACTING DEVICES

Roger Michael Elliott, Ipswich, England, assignor to B S P International Foundations Limited, Ipswich, England

Filed Jan. 13, 1976, Ser. No. 648,630
Claims priority, application United Kingdom, Jan. 15, 1975, 1769/75
Int. Cl.² B01F 11/00; E02D 3/06
U.S. Cl. 259—1 R 9 Claims

1. A soil compacting device comprising, in combination a vibrator body and a follower disposed substantially in line and forming an elongate assembly with the body below the follower, a vibratory mechanism within the body for generating oscillations transverse to the longitudinal axis of the assembly, means suspending the body from the follower, said suspension means comprising at least one flexible tension element, respective end portions of the body and follower being adjacent but spaced from each other and flexible sealing means extending between and enclosing said end portions, said sealing means comprising a resilient member that is precompressed by the tension in said at least one flexible element.

4,006,887

DEVICE FOR CONTINUOUS COATING OF FIBERS

Kaspar Engels, Mannheim, Germany, assignor to Draiswerke GmbH, Mannheim, Germany

Filed Aug. 11, 1975, Ser. No. 603,271
Claims priority, application Germany, Aug. 13, 1974, 2438818; Feb. 18, 1975, 2506784
Int. Cl.² B01F 7/02, 15/00; B05B 17/00
U.S. Cl. 259—9 18 Claims

1. A device for continuous coating of fibers, comprising:

a horizontally mounted cylindrical mixing container;

an inlet funnel entering into one end of said container;

an outlet funnel connected to the other end of said container;

a mixing shaft mounted coaxially within said container, said shaft being at least partially hollow;

drive means connected to said mixing shaft for driving said shaft at considerably supercritical speeds;

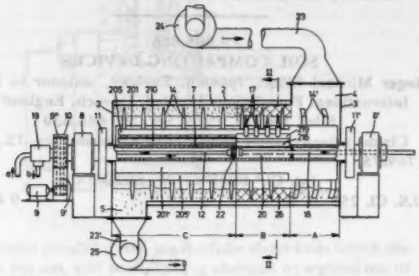
glue feed means for feeding glue into at least a portion of the interior of said shaft;

mixing tools connected to said shaft at least on an axial portion thereof;

glue agitating elements connected to said shaft on an axial portion thereof and extending into the ring of material formed on the inside wall of the cylindrical mixing container when said shaft is operated at a considerably supercritical speed, said elements being in the form of mixing rods extending into the ring of material, each of said rods being provided with at least one groove extending in the lengthwise direction, each of said grooves being open outwardly along its entire length and each of said grooves communicating with the interior of said mixer shaft for allowing dispensing of glue into the ring of material; and

means for ensuring air vorticization in said cylinder;

whereby fibers may be substantially homogeneously coated while avoiding substantial jamming and lumping of the fibers in the mixing container.



4,006,888

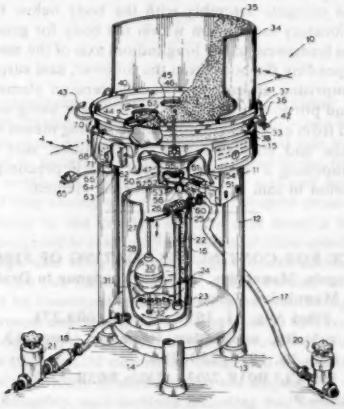
DRY GRANULAR FEEDER

Donald R. Emmons, 2909 Trentwood Blvd., Orlando, Fla. 32809

Filed Sept. 2, 1975, Ser. No. 609,288

Int. Cl.² B01F 5/00; G01F 11/06

U.S. Cl. 259—18 **12 Claims**



1. A granular material feeder comprising in combination;

a frame;

a hopper mounted to said frame;

a receiving tank mounted to said frame and located to receive granular material;

a movable flag rotatably attached to the top portion of said hopper by a shaft extending from said frame whereby rotating of the said shaft will indicate whether said flag is rotating in a granular material; and

feeding means for feeding granular material from said hopper to said receiving tank and being operatively connected to said hopper, said feeder means having an opening from said hopper thereinto and having a plunger slidably mounted therein and said feeding means including a path for granular material to move from the opening from said hopper therethrough to said receiving tank responsive to the sliding of said plunger whereby granular material is fed from said hopper to said receiving tank by the sliding of said plunger.

4,006,889

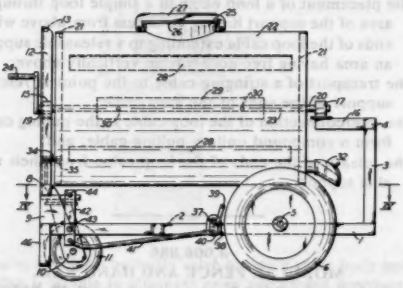
ASPHALT SEALER MIXER

Richard A. Perrott, Sr., P.O. Box 51, Hillsville, Pa. 16132

Filed July 18, 1975, Ser. No. 597,034

Int. Cl.³ B28C 7/16

U.S. Cl. 259—176 **5 Claims**



1. An asphalt sealer mixer comprising a pair of substantially horizontal side frame bars having front and rear ends, an axle secured to said bars near their front ends, wheels mounted on said axle, a pair of upright members rigidly connected at their lower ends to the front ends of the side frame bars, a cross bar secured to the upper ends of the upright members, a support bar connected at one end to the center of the cross bar and extending therefrom toward the opposite end of the mixer, a first bearing mounted on the free end of the support bar, a cross member supported by the side frame bars above their rear ends, a single rear swivel wheel between the rear ends of the side frame bars, means pivotally connecting the swivel wheel with the central portion of said cross member, a post mounted on the central portion of said cross member, a second bearing mounted on the upper end of said post in alignment with said first bearing, a mixing drum having spaced front and rear end walls connected by an encircling side wall, trunnions projecting from the centers of said end walls and rotatably mounted in said bearings, mixing vanes secured to the inside of the drum, the drum being provided in said side wall with a filling opening, a removable cover normally sealing said opening, the front end wall of the drum having a discharge opening located at the bottom of the drum when said filling opening is at the top, a discharge valve connected with said outlet opening and projecting forward from the end of the drum, the space between the front ends of said side frame bars being unobstructed to permit a pail to be inserted between them and moved back beneath said valve, and a crank secured to the trunnion in said second bearing for rotating the drum, said support bar being long enough for said valve to be carried around it by the rotating drum.

4,006,890

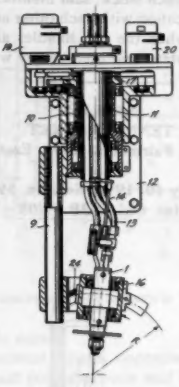
GAS-CUTTING TORCH ARRANGEMENT

Shimon Abramovich Vainer, ulitsa Logovskaya, 43, kv. 21; Anatoly Fedorovich Temerev, ulitsa Tsimlyanskaya, 34, kv. 46; Savely Abramovich Vainer, ulitsa Krasnopiterskaya, 23, kv. 46; Sergei Sergeevich Nikulin, ulitsa Bakhturova, 1, kv. 26; Matvei Evseevich Kheifets, ulitsa Dotsenko, 37, kv. 11; Vadim Anatolievich Usoltsev, ulitsa Panfilovskaya, 3, kv. 3; Evgeny Fedorovich Matveev, ulitsa Astrovskaya, 13; Georgy Petrovich Kazakov, ulitsa Petrogradskaya, 16, kv. 2; Vladimir Alexandrovich Salkov, ulitsa Krasnopresnenskaya, 31, kv. 33, and Anatoly Isidorovich Malinin, ulitsa Dotsenko, 74, kv. 21, all of Volgograd, U.S.S.R.

Division of Ser. No. 463,063, May 22, 1974, Pat. No. 3,944,441. This application May 28, 1975, Ser. No. 581,681

Int. Cl.² B23K 7/02

U.S. Cl. 266—77 1 Claim



1. An arrangement for orientating a torch for gas cutting machine, in making parts from sheet metal by means of oxygen cutting, the arrangement comprising a carriage in the cutting machine for mounting a cutting torch and two coaxial cylinders, the inner cylinder being fixedly mounted on said carriage while the outer cylinder is rotatably mounted in relation to said inner cylinder, which is connected through flexible means to said torch; the axis of the latter intersecting that of said cylinders at a point that lies on the surface of the sheet metal; said torch being fitted in a bearing which has an outer race linked to said outer cylinder; means to impart an angular motion to said torch in a vertical plane, at a predetermined small angle from the vertical, the angle of the oxygen jet to the cutting path remaining substantially constant irrespective of changes in the direction of the cut; gas-supply hoses, passing to said torch through said inner cylinder; and means for eliminating twisting of said hoses, constituted by said fixed inner cylinder, said flexible means and said bearing.

4,006,891

CRUCIBLE FOR MELTING SUPER-ALLOYS

David Alan Ford, Bristol, England, assignor to Rolls-Royce (1971) Limited, Great Britain

Filed July 9, 1976, Ser. No. 703,818

Claims priority, application United Kingdom, July 25, 1975, 31095/75

Int. Cl.² F27B 14/10

U.S. Cl. 266—284 4 Claims

1. A crucible for melting a nickel-based superalloy containing one or more of the elements of the group consisting of aluminium, titanium and hafnium, wherein the crucible is made of a material consisting by weight of 90 – 99% magnesia grains and 1 – 10% of an oxide being a bonding medium for the magnesia grains and being one of the group consisting of titania, hafnia and yttria, and wherein the purity of the magnesia is not less than 97%.

4,006,892

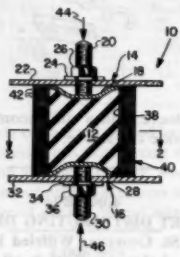
COMPRESSION MOUNTING

James B. Koeneman, Erie, Pa., assignor to Lord Corporation, Erie, Pa.

Filed Dec. 15, 1975, Ser. No. 640,359

Int. Cl.² F16F 1/36

U.S. Cl. 267—153 13 Claims



1. A compression mounting comprising

a body of elastomer,

first load-transmitting means for engaging and covering at least part of a first surface of the body of elastomer,

second load-transmitting means for engaging and covering at least part of a second surface of the body of elastomer opposite and spaced from said first surface, the first and second load-transmitting means being disposed and configured to expose a circumferential surface of the body of elastomer, and

shell means for completely covering and enclosing at least a circumferential portion of the exposed circumferential surface of the body of elastomer, said shell means including (a) filamentary means providing a plurality of substantially parallel and juxtaposed filament portions oriented to circumscribe the exposed circumferential surface, the filament portions being less extensible than said elastomer, and (b) matrix means encasing the filament portions of the filamentary means and flexibly bonding adjacent filament portions to one another in substantially parallel relationship, the shell means snugly fitting the exposed circumferential surface and the filamentary means causing the shell means to be more resistant to circumferential expansion than the body of elastomer so as at least to impede circumferential expansion of said portion of the exposed surface of the body of elastomer in response to compressive loads applied to the body through the load-transmitting means, adjacent filament portions in the shell means being movable in parallel planes relative to each other so that the shell means can deflect in response to torsional loads on the mounting.

4,006,893

SPRINGS

William Wilfred Spencer, 5 Tottenham Road, Baysville, East London, Cape Province, South Africa

Filed Apr. 15, 1976, Ser. No. 677,118

Claims priority, application South Africa, Apr. 17, 1975, 75/2463

Int. Cl.² F16F 1/12

U.S. Cl. 267—61 S 4 Claims

1. A device for strengthening a coil spring comprising a torsion spring having a helical formation with an arm extending generally tangentially from each end of the formation, each of the arms having a hook for engaging a coil of a coil spring, and a deformable body accommodated within the

helical formation resistively to oppose a reduction of the diameter of the helical formation, the deformable body being

in the form of a sleeve, and a stiff incompressible rod being snugly received inside the sleeve.

4,006,894

SHEET DISTRIBUTING DEVICE

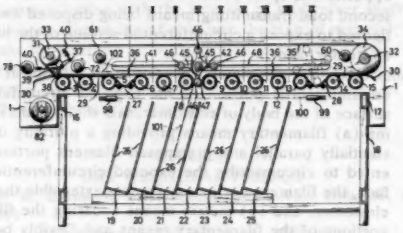
Hermann Raible, St. Georgen; Wilfried Dorer, Donaueschingen, and Werner Lehmann, Gutach, all of Germany, assignors to Mathias Bauerle GmbH, Firma, St. Georgen, Germany

Filed Mar. 3, 1975, Ser. No. 554,821

Claims priority, application Germany, Mar. 22, 1974, 2413908

Int. Cl.² B65H *29/58*

U.S. Cl. 271—173 **20 Claims**



1. A sheet distributing apparatus, comprising: a plurality of pockets having in-feed openings for receiving sheets in a predetermined sequence; sheet transport means for conveying sheets in feeding relation to the in-feed openings, said sheet transport means comprising guide rolls positioned in spaced apart parallel relation adjacent the in-feed openings and flexible conveyor belt means for capturing the sheets between the conveyor belt means and the guide rolls, whereby the sheets move in a transport plane; and deflector means moveable relative to the conveyor belt means and in timed relation with the sheets, said deflector means including a shaft provided with a plurality of radially extending arms adapted to move between adjacent ones of said guide rolls to form a loop in a conveyor belt means by partially wrapping said conveyor belt means around the guide rolls and the deflector means, thereby changing the direction of the sheet movement from the transport plane to the in-feed opening.

4,006,895

REVOLVING EXERCISING DEVICE

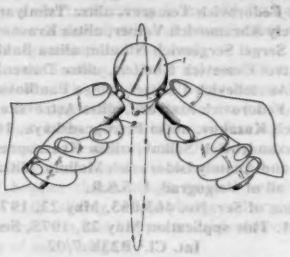
Anthony DiLaurenzio, 4832 Merten Ave., Cypress, Calif. 90630

Filed June 2, 1975, Ser. No. 582,588

Int. Cl.² A63B *23/00*

U.S. Cl. 272—67 **1 Claim**

1. A wrist exercising device comprising, in combination, a solid member, two bars imbedded into said member at an angle of generally 90° to each other, a stock freely rotatably mounted on and surrounding the axis of each bar, an outer



handle surrounding each stock, said member, bars, stock and handles in communication with each other and combined with each other so that when the two handles are grasped by the user, the user can rotate said member by wrist action.

4,006,896

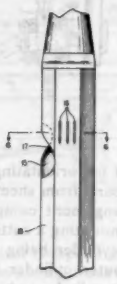
TENNIS RACKET

Alfred C. Soldavini, Fairmount Road, East Pottersville, N.J. 07979

Filed July 10, 1975, Ser. No. 594,794

Int. Cl.² A63B *49/08*

U.S. Cl. 273—73 J **6 Claims**



1. A tennis racket having a string matrix disposed in a common plane and held in position by a frame to form a surface for striking a tennis ball, an extended handle linking said strings to a player's hand and indexing means on said handle for positioning the junction point between the player's thumb and forefinger with respect to said common plane characterized in that said indexing means includes at least one raised surface irregularity and a set of lines parallel to the long axis of said handle, said parallel lines being disposed on the surface of said handle in a predetermined position with respect to said common plane so as to cooperate with the point of junction between a holder's thumb and forefinger and said surface irregularity being disposed on said handle to engage at least one gripping finger of a holder's hand.

4,006,897

SIMULATED TENNIS GAME

Eliseo Ordinaga Llorens, Valencia, Spain, assignor to Cremeal S.A., Valencia, Spain

Filed Feb. 28, 1975, Ser. No. 554,325

Claims priority, application Spain, Mar. 1, 1974, 201078[U]; July 12, 1974, 204600[U]; July 12, 1974, 204601[U]

Int. Cl.² A63F *9/14*

U.S. Cl. 273—85 R **11 Claims**

1. A skilled game of simulated tennis or table tennis type, said game comprising:

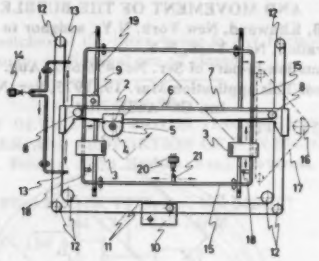
a frame;

a translucent screen supported by said frame and representing a playing court, said screen having opposite side edges representing lateral boundaries of said court and opposite end edges representing end lines of said court;

a luminous point representing a ball supported for zig-zag type movement beneath said screen, each said zig-zag type movement being the resultant vector from simultaneous movement of said point between said lateral boundaries and between said end lines;

a pair of segments representing raquets or players, one each slidably mounted on a transverse bar support adjacent a respective one of said end lines for transverse movement therealong between said lateral boundaries;

a pair of segment movement means, one each operatively connected to a respective one of said segments, for selectively and manually moving said segments along said



respective transverse bar supports between said lateral boundaries;

a first reversible motor;

first point movement means, operable by said first motor, for moving said point between said lateral boundaries;

first switch means, connected to said first motor, for reversing the direction of said first motor and said first point movement means upon movement of said point to one of said lateral boundaries;

a second reversible motor;

second point movement means, operable by said second motor, for moving said point between said end lines; and

second switch means, connected to said second motor, for reversing the direction of said second motor and said second point movement means upon movement of said point to one of said end lines when the respective said segment has been manually moved to a position to block the path of movement of said point.

4,006,898

VIDEO GAME TARGET RESET APPARATUS

Clarence Greaf, and William R. Price, both of Fort Wayne, Ind., assignors to The Magnavox Company, Fort Wayne, Ind.

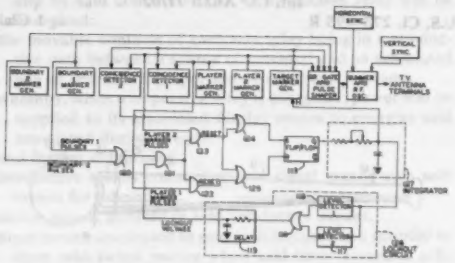
Filed Oct. 28, 1975, Ser. No. 626,166
Int. Cl.² A63F 9/00
U.S. Cl. 273—85 R **9 Claims**

1. In an electronic video game having means for generating a signal representing a target marker, means for generating a plurality of signals representing a plurality of game player position markers including 1st and 2nd game player position markers, means for generating a signal representing a boundary marker, and a flip flop for changing the direction of travel of said target marker, an improved target marker reset comprising:

a. coincident detection circuit means for receiving said signal for representing a boundary marker and said plurality of signals representing a plurality of game player position markers, said coincident detection circuit means having an output signal when a player position marker is coincident with a boundary;

b. lockout circuit means connected to said flip flop output terminal for providing a signal when a target marker is in an out of bounds region; and

c. means for changing the state of said flip flop, said means



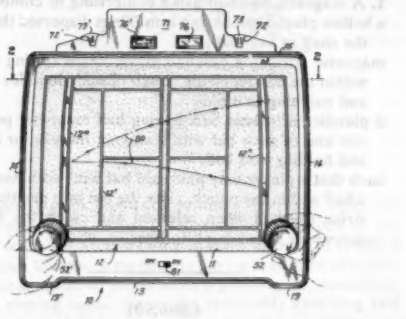
being operatively connected to said lockout circuit means and said coincident detection circuit means whereby the state of said flip flop will change when said coincident detection circuit output signal occurs simultaneously with said lockout circuit means output signal.

4,006,899

DEVICE SIMULATING PLAY ACTION GAME

Raymond J. Lohr; Richard N. Carver; Charles M. Kienholz; Calvin S. Cook, and Maxmillian P. Rogers, all of Erie, Pa., assignors to Louis Marx & Co., Inc., Glen Dale, W. Va.

Continuation-in-part of Ser. No. 544,545, Jan. 27, 1975, abandoned. This application Mar. 3, 1976, Ser. No. 663,375
Int. Cl.² A63F 9/14
U.S. Cl. 273—85 R **18 Claims**



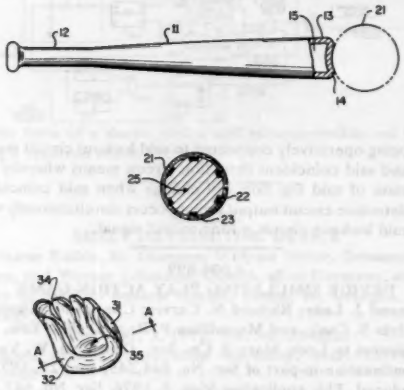
1. A game device comprising a housing, a screen associated with said housing, indicia on the screen simulating a playing field, a boom having opposed ends, means mounting said boom for universal movement of an end thereof within said housing in a plane substantially parallel to the screen, actuable signal means mounted in said end of said boom for projecting a signal on said screen simulating a game piece in play on the simulated field, drive means mounted in said housing for reciprocating the signal end of said boom across said screen, a pair of movable deflectors movably mounted in said housing for buffeting the signal end of said boom across said screen at random verticals to the reciprocal horizontal, and means for independently moving each said deflector along a corresponding scoring position of the simulated playing field provided on the screen for thereby striking and returning the simulated game piece across the playing field in the manner corresponding to game play, as observed on the screen, each cross buffet of the signal end of the boom by a respective deflector corresponding to a successful game piece return, and each concomitant misregistration of a deflector and the signal end of the boom corresponding to a missed game piece which concludes a match play point.

4,006,900

MAGNETIC BASEBALL, BAT AND GLOVE

Joseph A. DiVito, 10 Alden Ave., Hull, Mass. 02045

Filed Feb. 5, 1975, Ser. No. 547,111
Int. Cl.² A63B 71/02
U.S. Cl. 273—95 R 1 Claim



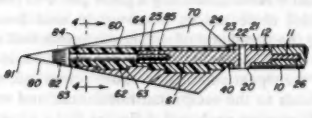
1. A magnetic baseball game comprising in combination:
a hollow plastic ball having iron filings dispersed throughout the shell of said ball,
magnetic attracting baseball glove means having a magnet within the ball receiving pouch of said glove for receiving and catching said ball,
a plurality of plastic bats having ball receiving pouches at one end of each bat with a magnet therein for attracting and holding said ball,
such that a player may hold said bat with both hands, place a ball within the pouch, raise the bat into position, jerk it, strike the ball when released and catch the ball when thrown or struck back to him.

4,006,901

ARROWHEAD

Miroslav Andrew Simo, Riverside, Ill., assignor to New Archery Products Corporation, Riverside, Ill.

Filed Oct. 6, 1975, Ser. No. 619,824
Int. Cl.² F41B 5/02
U.S. Cl. 273—106.5 B 15 Claims



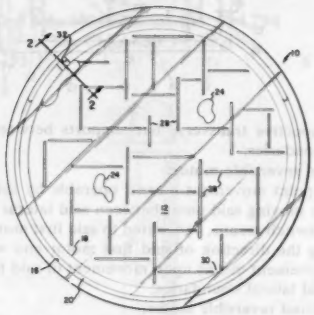
1. An arrowhead assembly for attachment to the head end of an arrow shaft comprising:
an adapter shaft having a head end and an other end, said other end having fastening means for securement to said head end of an arrow shaft and means for fastening a nosepiece at said adapter shaft head end;
an arrowhead body forming a hollow cylinder, said hollow cylinder having a diameter greater than said adapter shaft providing freely rotatable movement when said adapter shaft is inserted in said hollow cylinder, multiple blades firmly mounted within said body and having a shape exterior to said arrowhead body adapted for good aerodynamic flight characteristics and keep target penetration; and
a conical nosepiece having a fastening means at its tail end for mating with said fastening means in the head end of the adapter shaft fastening said nosepiece in fixed relation to said adapter shaft and said arrow shaft while allowing freely rotatable movement of said arrowhead body and blades.

4,006,902

AMUSEMENT DEVICE WITH A BUBBLE MOVABLE IN A LIQUID HAVING MEANS FOR CONTROLLING THE SIZE AND MOVEMENT OF THE BUBBLE

Antoine B. Khawand, New York, N.Y., assignor to Dynavision Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 495,682, Aug. 8, 1974, abandoned. This application Mar. 19, 1975, Ser. No. 559,909
Int. Cl.² A63F 7/04
U.S. Cl. 273—113 12 Claims



1. An amusement device comprising upper and lower plates and a side wall forming a closed container having a hollow space with a fluid therein, a bubble of material different from said fluid which moves therein, means forming a channel surrounding said hollow space of said closed container, said channel forming means including said side wall, and a passageway through said side wall for selectively admitting a part of the bubble from the hollow space into the channel for controlling the size of the bubble.

4,006,903

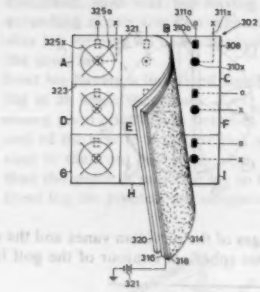
ELECTRICAL TICK-TACK-TOE GAME

Benjamin J. Barish, 36 Yehuda Hanassi, Tel Aviv, Israel

Filed July 7, 1975, Ser. No. 593,730
Int. Cl.² A63F 3/00
U.S. Cl. 273—130 AB 10 Claims

1. An electrical Tick-Tack-Toe game comprising an electrical switching device having a face divided into a rectangular matrix of nine boxes arranged in three horizontal rows of three boxes in each row, and three vertical columns of three boxes in each column; a first and a second electrical switch in each box; a first electrically-actuatable indicator located outside said rectangular matrix; a second electrically-actuatable indicator located outside said rectangular matrix; and electrical circuit means including a first electrical circuit effective to actuate said first indicator to provide a first indication whenever said first electrical switches of the three boxes in any horizontal row, vertical column, or diagonal are all closed, and

a second electrical circuit effective to actuate said second indicator to provide a second indication whenever said second



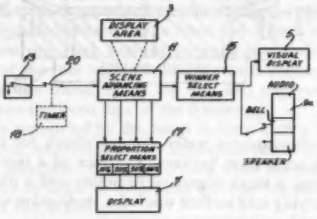
electrical switches of the three boxes in any horizontal row, vertical column, or diagonal are all closed.

4,006,904

DISPLAY DEVICE FOR PROJECTING SCENES, WIN SIGNALS, AND PROPORTION OF WIN SIGNALS

Edward M. Felsher, 5650 Hudson Ave., Montreal, Quebec, Canada

Filed Feb. 10, 1975, Ser. No. 548,777
Int. Cl.² A63B *71/06*
U.S. Cl. 273—138 A **1 Claim**



1. A display device for displaying one of a plurality of scenes, and comprising;

a slide projector for containing representations of said plurality of scenes on slides mounted in said slide projector, a display area comprising said projector screen, means for projecting one of said slides at a time on said projector screen, and, means for advancing said slides into the project position on receipt of a scene advancing signal from a signal means;

means associated with preselected scenes for activating a win signal;

means associated with preselected ones of said preselected scenes for activating a proportion of win signal;

display means for displaying a win signal and a plurality of further display means for displaying respective proportions of win signals;

wherein, each slide comprises a plurality of markings on an end thereof;

a conductive bar on each slide connecting all of said markings, said conductive bar being connected to ground potential;

a plurality of spring contacts mounted in said slide projector such that each spring contact is adjacent a respective marking when the slide is in the project position:

each of said contacts being connected to one end of a respective relay, the other end of the relay being connected to a source of potential;

and conductive clips for mounting on selective ones of said markings of said preselected slides;

said spring contacts being adapted to contact the clip on its respective marking when the slide, carrying the marking, is in its project position;

whereby, when a contact is grounded through a conductive clip by said conductive bar, its respective relay will be energized;

the movable contacts of each said relay being in a conductive path between a source of potential and an associated win or respective proportion of win display means;

whereby, when a respective relay is energized, power will be supplied to its associated display means to energize said associated display means;

and further comprising:

conductive means connecting said signal means with said means for advancing;

switch means inserted in said conductive means;

timer means connected to said switch means and adapted to open said switch means when said timer means is activated whereby to prevent said means for advancing from receiving said signal, said switch means being closed when said timer is not activated;

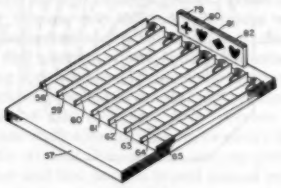
whereby to introduce an element of time randomness in the advancement of said representations.

4,006,905

SOLITAIRE GAME LAP BOARD

Thomas Kingston Marbury, 227 Harrill St., Forest City, N.C. 28043

Filed Apr. 21, 1975, Ser. No. 569,808
Int. Cl.² A63F *1/10*
U.S. Cl. 273—148 A **4 Claims**



1. A solitaire game board comprising a rigid main body, flat surface areas at the forward and rearward portions of the body, the rearward portion being of a size suitable to shuffle a deck of cards thereon, a receptacle having four open compartments each of a size to accomodate a plurality of conventionally sized playing cards, means for removably attaching said receptacle to said forward portion with the compartments opening upwardly, the body portion between the forward and rearward portions comprising a surface having at least seven equally spaced steps descending from the rearward portion to the forward portion, vertically and longitudinally extending dividers disposed on said stepped surface and dividing said surface into seven equal sized areas each extending between the rearward and forward portions, each area being of a size to accomodate at least seven conventionally sized playing cards in longitudinally extending overlapped relation with the edges of successive cards abutting successive steps, and a finger recess disposed at the forward end of each area.

4,006,906

CARD GAME

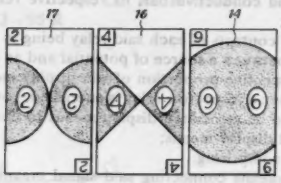
Jeffrey S. Gruber, Ile-Ife, Nigeria, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Feb. 27, 1976, Ser. No. 662,115
Int. Cl.² A63F *1/00*
U.S. Cl. 273—152 R **2 Claims**

1. A card game, comprising

a creator's card; and

120 cards, said cards being divided into 12 groups each having 10 cards numbered zero to 9, said cards being divided into 4 groups each having 30 cards of the same



pattern of one of a bar, an arc, a point and a semicircle, and said cards being divided into 3 groups each having 40 cards of the same color of one of three colors.

4,006,907

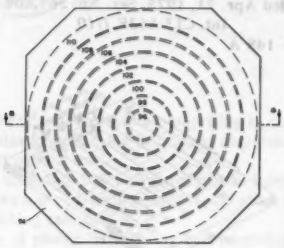
GAME APPARATUS

Russell H. Heffley, Jr., 1533 Lochinvar Drive, Fort Wayne, Ind. 46825

Division of Ser. No. 405,575, Oct. 11, 1973, Pat. No. 3,897,947. This application Dec. 9, 1974, Ser. No. 530,741

Int. Cl.² A63B *69/36*

U.S. Cl. 273—185 A **6 Claims**



1. A game apparatus of the type which includes a target connected to a scoreboard comprising a target having a plurality of target zones, a plurality of impact responsive signal generators, each of said target zones having at least one of said signal generators operatively connected to said zone, whereby an object impacting on each of said target zones will create a signal, a signal selector circuit operatively connected to said signal generators, and a plurality of scoreboard drivers operatively connected to said selector circuit and each of said target zones.

4,006,908

PRACTICE GOLF BALL

Tieko Minami, Tokyo, Japan, assignor to Yoichi Kawamura, Yokohama, Japan

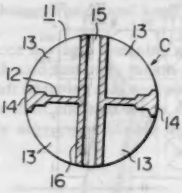
Filed Apr. 13, 1976, Ser. No. 676,654

Claims priority, application Japan, Apr. 17, 1975, 49-52540

Int. Cl.² A63B *69/36*

U.S. Cl. 273—183 C **5 Claims**

1. A golf ball for practice constituted by a spherical structure having a polar axis and made of an elastic tough material, said spherical structure comprising, in integrally formed state: a circular equatorial vane lying in an equatorial plane perpendicular to the polar axis; a hub part disposed coaxially relative to the polar axis and extending between opposite outer sides of the spherical structure; a plurality of meridian vanes of substantially semicircular planar shape lying in respective meridian planes spaced at equal angular intervals and mutually intersecting at the polar axis, the meridian vanes being integrally joined at their chordal parts to the hub part; and a middle band of a specific width engirdling the spherical structure around the circumference of the equatorial vane, the



semicircular outer edges of the meridian vanes and the middle band forming the outer spherical contour of the golf ball.

4,006,909

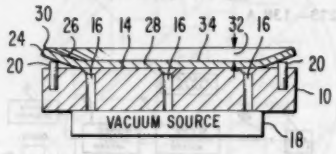
SEMICONDUCTOR WAFER CHUCK WITH BUILT-IN STANDOFF FOR CONTACTLESS PHOTOLITHOGRAPHY

Joel Ollendorf, West Orange, and Frank J. Cestone, Flemington, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Apr. 16, 1975, Ser. No. 568,716

Int. Cl.² B23B *31/00*

U.S. Cl. 279—3 **5 Claims**



1. A semiconductor wafer vacuum chuck for providing a controlled separation between a surface of a semiconductor wafer having a small degree of flexibility and a photographic mask overlying said surface upon the application of a vacuum to said chuck comprising:

an element including at least one substantially planar surface for receiving said wafer thereon, said element having means to allow a vacuum to be applied to said planar surface, and

means disposed on said surface of said element for mechanically maintaining a fixed distance between a peripheral portion of said wafer supported on said means and said surface of said element, said means being made of non-resilient material and extending no more than about 0.1 millimeters above said surface, and positioned in a pattern to allow a central portion of said wafer spaced inwardly from said means to be drawn towards said surface of said element upon the application of said vacuum to said surface of said element.

4,006,910

FOLDING SEAT

Charles R. Beckley, 2708 Woodley Place, Washington, D.C. 20008

Filed Sept. 16, 1975, Ser. No. 613,918

Int. Cl.³ A47C *4/32*

U.S. Cl. 297—16 **16 Claims**

1. A seat which is foldable to assume either an erect sitable condition or a collapsed storable condition, comprising:

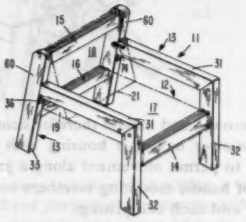
A. A pair of frame members which define sides of the seat wherein each frame member comprises:

an arm having front and rear ends and extending generally in a horizontal direction when the seat is in the erect condition;

a rear leg having a certain width and pivoted adjacent to the rear end of the arm to extend therefrom when the seat is erect and to extend therealong when the seat is collapsed, said rear leg having a projecting portion extending above the arm when the seat is erect, said rear leg forming an acute angle with the top surface of the arm; and

a front leg having a link fixed rigidly thereto and extending at an angle therefrom;

a sliding pivot connection between the link and the front end of the arm to pivot the link and the front leg adjacent to the front end of the arm, said link being longer than the width of said rear leg so that when the link and front leg are pivoted to collapse the seat, the front leg



overlies the rear leg, wherein the sliding pivot connection allows the link and the front leg to pivot when the link is slid to a first position and prevents the front leg from pivoting when slid to a second position;

B. a system of rungs which combine with the pair of frame members to define a top, a front and a back of the seat, wherein one rung extends between the projecting portions of the rear legs, one rung extends between the rear legs of the frame below the arm and one rung extends between the front legs of the frame; and

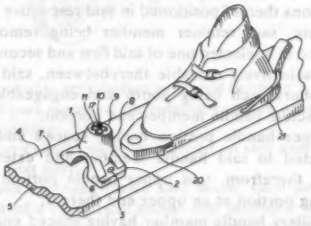
C. a web supported by the rungs to form a sling for seating a person, wherein said web applies torque to said rear leg in the direction of said front rung when the person sits in the web in order to help keep the rear leg erect when a person sits in the seat.

4,006,911

RIGID SKI-MOUNTING STABILIZER

Robert A. Kraus, and Edmund J. Kraus, both of 14160 Redhill, Tustin, Calif. 92680

Filed Aug. 19, 1975, Ser. No. 605,931
Int. Cl.² A63C *5/06*
U.S. Cl. 280—11.37 E **6 Claims**



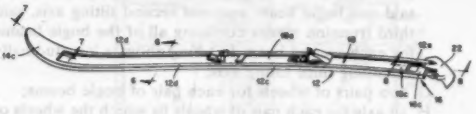
1. A device for the rigid reception of a conventional ski pole to stabilize and align a snow ski during the mounting operation to its corresponding ski boot, comprising a substantially conical receptacle having at least one flange on its lower portion for the purpose of fastening the receptacle to the upper side of a snow ski, and having at least one opening on its lower portion for the purpose of ejecting a possible accumulation of ice and snow from within by pushing the lower end of a ski pole into the receptacle's axial aperture, and comprising a series of longitudinal internal ridges extending from the receptacle's substantially conical inner wall inwardly in such a way as to align the receptacle's longitudinal inner ridge's crests substantially parallel to each other, so that if the lower end of a conventional ski pole is inserted into the receptacle's axial aperture each of the longitudinal ridge's crests will make a full longitudinal contact with the outer wall of the inserted ski pole to establish a rigid mechanical connection between the ski and the ski pole, and wherein the receptacle's inner spaces increase from the receptacle's upper end downward to the receptacle's lower opening.

4,006,912

SKI PROTECTOR

Frank J. Perlich, Excelsior, Minn.; Frank J. Perlich, Jr., Big Sky, Mont.; Jon R. Perlich, Tucson, Ariz., and Timothy C. McLaughlin, Mound, Minn., assignors to Frank J. Perlich, Excelsior, Minn.

Filed Sept. 24, 1975, Ser. No. 616,259
Int. Cl.² A63C *11/20*
U.S. Cl. 280—11.38 **14 Claims**



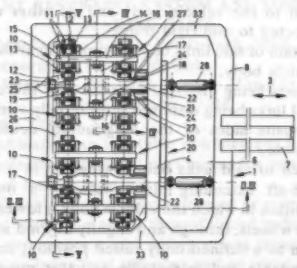
1. A ski protector comprising an elongated body portion having inwardly facing U-shaped grooves at the sides thereof for receiving therein only the marginal sides of a ski and having a height corresponding substantially to the thicknes of said sides, a first portion at one end of said elongated body portion having top, bottom and side walls forming a recess or cavity for enclosing the toe of the ski, and a second portion at the other end of said elongated body portion having top, bottom and side walls forming a recess or cavity for enclosing the heel of the ski, said body portion and the grooves therein extending from said first portion to said second portion and at least a longitudinal section of said body portion being resilient so that, when said first portion is placed over the ski's toe, said second portion can be pulled rearwardly and then released to fit over the heel.

4,006,913

LOW HEIGHT SEMI-TRAILER

Bengt Ingemar Rimhagen, Linkoping, Sweden, assignor to Linkoepings Transportindustri AB, Linkoeping, Sweden

Filed July 14, 1975, Ser. No. 595,375
Int. Cl.² B62D *21/02*
U.S. Cl. 280—43.13 **7 Claims**



1. An undercarriage which supports the body of a vehicle such as a trailer and which has numerous wheels that share equally in the support of the body and any load thereon not-

withstanding irregularities in the surface over which the vehicle may be moving, said undercarriage comprising

a pair of undercarriage assemblies symmetrically disposed at opposite sides of a longitudinal centerline of the vehicle and each characterized by:

A. a laterally extending first beam;

B. first trunnion means medially pivotally connecting said first beam with the vehicle body and enabling the opposite ends of the first beam to be swingable up and down about a longitudinally extending tilting axis;

C. a pair of second beams which extend longitudinally;

D. second trunnion means medially pivotally connecting said second beams, respectively, with opposite end portions of the first beam so that the second beams are carried bodily up and down by tilting motion of the first beam but the opposite end portions of said second beams are swingable up and down about the first beam and around a common laterally extending second tilting axis;

E. two pairs of laterally extending bogie beams for each of said second beams;

F. third trunnion means medially pivotally connecting each bogie beam with its second beam and disposing one bogie beam of each pair near an end of its second beam and the other bogie beam of the pair between said one bogie beam and said second tilting axis, said third trunnion means confining all of the bogie beams for each second beam to tilting about a longitudinally extending third tilting axis;

G. two pairs of wheels for each pair of bogie beams;

H. an axle for each pair of wheels by which the wheels of the pair are constrained to rotate about a common axis and are maintained axially spaced apart by a fixed distance; and

I. means providing a connection between each axle and a pair of adjacent end portions of its pair of bogie beams, whereby the axle is carried by said bogie beams between their said end portions, the pair of bogie beams is constrained to swing in unison about said third tilting axis, and the axle is confined to an orientation in which its axis extends laterally and is tiltable about an axis intermediate its ends, the last mentioned means comprising a rigid longitudinally extending member connected at its ends with said end portions of said pair of bogie beams and which has a medial connection with said medial portion of said axle.

3. The undercarriage of claim 1, further characterized by means connecting said undercarriage assemblies with one another and with the vehicle body in a manner that provides for raising and lowering the vehicle body relative to the wheels, the last mentioned means comprising:

1. a substantially rigid frame having substantial longitudinal extent and having substantial lateral extent symmetrically to the longitudinal centerline of the body, said first trunnion means providing a connection between each of said first beams and said frame;

2. a plurality of links, each having one end pivotally connected to the vehicle body and its other end pivotally connected to said rigid frame,

a. certain of said links being disposed near the front of the vehicle body,

b. others being disposed near the rear thereof, and

c. said links being disposed substantially symmetrically to opposite sides of the longitudinal centerline of the vehicle,

d. each of said links being swingable in a vertical fore-and-aft extending plane between a near-horizontal position in which the vehicle body is lowered relative to the wheels, through and slightly beyond a vertical position to a defined body-raised position; and

3. extendable and retractable actuator means connected between the vehicle body and said rigid frame for so moving the body relative to the frame as to swing the links between their said near-horizontal positions and their said body-raised positions.

4,006,914

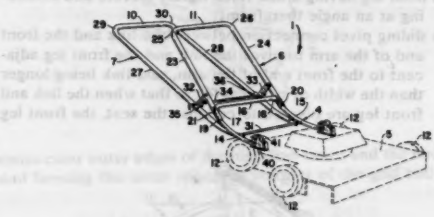
LAWNMOWER HANDLE FOR MOWING TERRACES

Edward G. Koch, 716 Benton Blvd., Kansas City, Mo. 64124

Filed Oct. 15, 1975, Ser. No. 622,771

Int. Cl.² B62B 5/06

U.S. Cl. 280—47.37 R **3 Claims**



1. A lawnmower and handle therefor comprising:

a. a lawnmower having a housing with wheels mounted thereon to permit movement along a ground surface;

b. a pair of handle mounting members on said lawnmower housing and each comprising:

1. a first bracket and a second bracket positioned in spaced relation;

2. means in said first bracket and said second bracket defining generally C-shaped apertures each having laterally aligned first and second vertically spaced pockets and a passage therebetween; and

3. a support member extending between said first bracket and said second bracket and having respective end portions thereof positioned in said respective apertures, said support member being removably received in a selected one of said first and second pockets and selectively movable therebetween;

c. a handle member having spaced end portions each positioned between said respective first and second bracket and pivotally mounted thereon, said handle member end portions each being above and engageable with said respective support member;

d. means on each of said handle mounting members for retaining said respective handle member end portion therebetween and each comprising:

1. means in said first bracket and said second bracket defining second generally C-shaped apertures each having laterally aligned first and second vertically spaced pockets and a passage therebetween; and

2. a retainer member extending between said first bracket and said second bracket and having respective end portions thereof positioned in said respective apertures therein, said retainer member being removably received in a selected one of said first and second pockets and selectively movable therebetween, said retaining members each being above and engageable by said respective handle member end portion;

e. an upper handle portion having spaced end portions connected to said handle member and extending upwardly therefrom, said upper handle portion having a gripping portion at an upper end thereof;

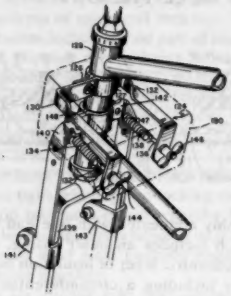
f. an auxiliary handle member having spaced end portions pivotally mounted on said handle member adjacent the spaced end portions thereof and having a gripping portion positioned rearwardly of and substantially level with the gripping portion of said upper handle portion; and

g. means mounted on said upper handle portion and engageable by said auxiliary handle member for adjustably retaining same in a selected positioned relative to said upper handle portion.

4,006,915
CYCLE STEERING STABILIZER

C. William Parker, 53 Cedar St., Lynn, Mass. 01905

Continuation-in-part of Ser. No. 364,627, May 29, 1973, abandoned. This application Feb. 7, 1975, Ser. No. 547,871
Int. Cl.² B62K *21/10*
U.S. Cl. 280—271 4 Claims

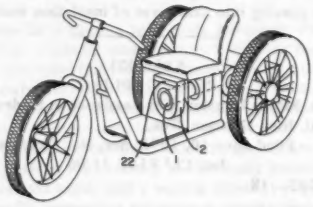


1. A cycle steering stabilizer comprising a column clamp mountable on a fixed portion of the steering column frame of said cycle, said clamp having a pair of arms which extend rearwardly with respect to the long axis of said cycle on each side thereof, a pair of fork clamps, each clamp mountable on a separate branch of the front wheel steering means of said cycle and tensable resilient means connecting respectively each fork clamp with its opposed arm of said column clamp to restrain excessive turning and jackknifing of the steering wheel of said cycle.

4,006,916
LOCKABLE ARTICULATION

Pierre Patin, Paris, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed July 1, 1975, Ser. No. 592,177
Claims priority, application France, July 5, 1974, 74.23406
Int. Cl.² B62K *5/04*; F16D *51/60*
U.S. Cl. 280—282 15 Claims



1. A lockable articulation arranged between a first part and a second part mounted for relative rotation about a first axis and comprising:

a hollow cylindrical drum centred on said axis and fast with said first part;

two jaws arranged inside said drum, each jaw having the form of a cylindrical sector and provided with a friction surface for bearing against the inner surface of the wall of said drum, said jaws being arranged with one end of each said jaw adjacent one end of said other jaw and said other ends of said jaws spaced apart and defining dihedral bearing surfaces, the angle between said dihedral bearing surfaces opening outwardly to said drum; and

means for locking said first and second parts against relative rotation and operable to spread said jaws apart, said locking means comprising:

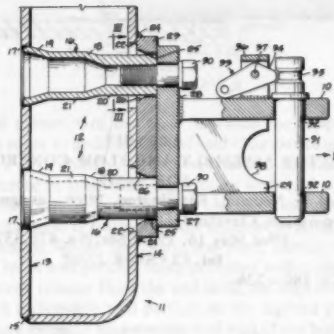
at least one roller interposed between said inner surface of said wall of said drum and said dihedral surfaces of said jaws for spreading said jaws apart; means for moving said roller including at least one hinged lever means forming a knee and comprising a first and a second link, said first link being pivoted on said second part and on said second link and said second link bearing said roller;

wherein said dihedral bearing surfaces, said pivotal axis of said lever means and the axis of said roller are parallel with said axis of relative rotation of said first and second parts.

4,006,917
ENERGY ABSORBING PULL HOOK FOR CONSTRUCTION VEHICLES

Douglas P. Liehr, and Erich E. Drochner, both of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed July 14, 1975, Ser. No. 595,909
Int. Cl.² B60D *1/00*
U.S. Cl. 280—451 25 Claims



1. An energy absorbing and safety pull hook arrangement in combination with a construction vehicle having a frame defining an aperture thereon comprising

a pull hook, and

energy absorbing means normally secured between said frame and said pull hook and disposed in alignment with said aperture for being sequentially detached from said frame when pulling forces imposed on said pull hook to pull it away from said frame exceed a predetermined magnitude and for thereafter progressively absorbing said pulling forces when they exceed said predetermined magnitude by being drawn through said aperture.

4,006,918
INFLATABLE CONFINEMENT FOR VEHICLE OCCUPANT RESTRAINT SYSTEM AND METHOD OF MAKING SAME

Robert W. MacFarland, Grosse Pointe Park, Mich., assignor to Eaton Corporation, Cleveland, Ohio

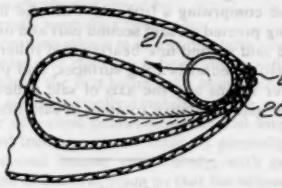
Filed Feb. 28, 1973, Ser. No. 336,859
Int. Cl.² B60R *21/08*
U.S. Cl. 280—729 15 Claims

1. In combination an inflatable confinement for a vehicle occupant restraint system and port means for communicating inflating fluid thereto, wherein

a. said inflatable confinement is formed of a single layer of material with the margins thereof joined in fluid pressure sealing arrangement and with portions thereof disposed to form an inner fluid chamber and an outer fluid chamber with an aperture formed in the wall of each of said chambers with said port means received therethrough, and

b. said port means has a longitudinal portion thereof com-

municating only with said inner chamber and a portion thereof communicating only with said outer chamber for



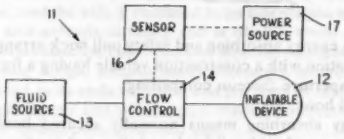
permitting introduction of inflating fluid simultaneously thereto.

4,006,919

INFLATOR ASSEMBLY AND FLOW CONTROL VALVE FOR SAME

Richard F. Neuman, Farmington, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed May 16, 1974, Ser. No. 470,337
Int. Cl.² B60R *21/08*
U.S. Cl. 280—736 **32 Claims**



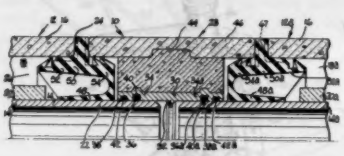
1. In a vehicular safety system having an inflatable occupant restraint, reservoir means operatively connected to said restraint and containing a supply of pressurized gas therein, and valve means for controlling the flow of gas from said reservoir means into said restraint, comprising the improvement wherein said valve means includes a valve housing operatively interconnected to the outlet opening of said reservoir means, said valve housing having a flow passage therethrough, and a valve member disposed within said passage and supported on said housing member for movement relative thereto between a first position wherein said restraint is normally maintained in a collapsed condition and a second position wherein said restraint is at least partially inflated, said valve housing and said valve member including cooperating wall means defining a flow control orifice which is of progressively increasing area as said valve member moves from said first position toward said second position, said valve member being disposed such that flow from said outlet opening impinges thereupon in a direction substantially transverse to the direction of movement of said valve member urging said cooperating wall means together to create a predetermined frictional force resisting movement of said valve member, said wall means including means cooperating with certain surfaces of said valve member to form a chamber, and said wall means includes means defining a second passage communicating said source of fluid pressure with said chamber thereby permitting fluid source pressure to be applied to the said certain surfaces of said valve member for moving same.

4,006,920

JOINT ASSEMBLY FOR INSULATING HIGH TEMPERATURE FLUID CARRYING CONDUITS

Thomas Harry Sadler, Morrison, and Ronald Neal Cerny, Littleton, both of Colo., assignors to Johns-Manville Corporation, Denver, Colo.

Filed Mar. 12, 1975, Ser. No. 557,704
Int. Cl.² F16L *11/12*
U.S. Cl. 285—14 **13 Claims**



1. A joint assembly connected with one end of heat insulated conduit which includes an outer casing, a concentric inner core and a concentric layer of insulation material therebetween, said core including a circumferential end section extending longitudinally beyond adjacent ends of said casing and layer of insulation material, said assembly comprising:

a. a coupling arrangement at least including a coupling having a first longitudinal portion which is located concentrically around a first portion of said core end section and which is spaced from the adjacent ends of said casing and insulation material and a second portion which is adapted to connect said one end of said conduit to an adjacent end of a second conduit;

b. a circumferential end seal located concentrically around and against a second portion of said core end section between said adjacent ends and said coupling, one circumferential side of said end seal engaging against the adjacent ends of casing and insulation material and its opposite circumferential side facing said coupling; and

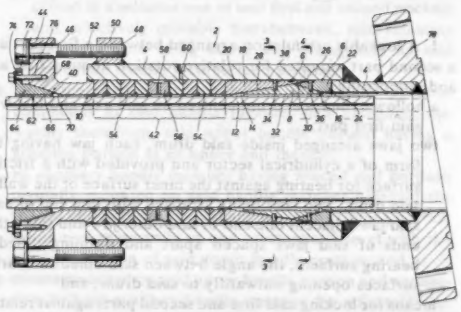
c. said coupling and end seal together defining a passage, said passage extending therebetween from said core outwardly to the outer surface of said coupling arrangement and ambient surroundings of said joint assembly, said passage being such that fluid therein and under a predetermined amount of pressure in the direction towards the outer surface of said coupling arrangement will move out of said passage in the direction of said pressure to the ambient surroundings, said end seal preventing said fluid from passing into said layer of insulation material.

4,006,921

PIPE COUPLING

Harvey O. Mohr, Houston, Tex., assignor to HydroTech International, Inc., Houston, Tex.

Filed June 10, 1975, Ser. No. 585,504
Int. Cl.² F16L *35/00*
U.S. Cl. 285—18 **12 Claims**



1. In apparatus for locking together two mutually telescoping rigid tubular members against relative axial movement, the

combination comprising:

annular bowl means locked within one of said rigid tubular members and including a pair of axially and oppositely tapered annular surfaces;

annular gripping means comprising a plurality of gripping elements disposed within said annular bowl means, said annular gripping means including a pair of oppositely tapered surfaces mateably engaged with respective tapered surfaces of said bowl means;

said bowl means including said pair of annular bowl surfaces and said gripping means being movable between a retracted position in which said rigid tubular members are freely assemblable in the mutually telescoping relationship aforesaid and an extended and locked position in which said bowl means including said pair of annular bowl surfaces applies opposing forces against both tapered surfaces of said gripping means to squeeze the latter into tight gripping and locking engagement with the other rigid tubular member whereby both tubular members are locked against relative axial movement while said bowl means is at least partially engaged with said one rigid tubular member;

and means for moving said bowl means and said gripping means towards said extended positions.

4,006,922

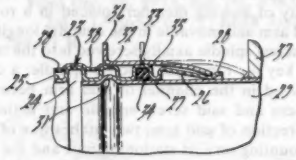
NON-THREADED TUBING CONNECTOR

Donald D. Bartholomew, Utica, Mich., assignor to Merit Plastics, Inc., East Canton, Ohio

Division of Ser. No. 358,916, May 10, 1973, abandoned. This application Feb. 20, 1975, Ser. No. 551,092

Int. Cl.² F16L *35/00*

U.S. Cl. 285—39 **3 Claims**



1. In a tube for a fluid, a tube body having an end section insertable over a tubular element which extends therewithin, the wall of said tube body is corrugated having alternate inwardly and outwardly presenting continuous annular sections, an inwardly presenting continuous annular bead near the end of the tubular element received by an inwardly presenting corrugation into which the bead extends, and means comprising a locking sleeve for securing the inwardly presenting corrugation over said bead, and a sealing element provided in a second inwardly presenting continuous corrugation which is maintained in engagement with said tubular element by said locking sleeve, said tube body having an inclined plane means converging toward the end and having thereat means comprising a locking lip for securing the end of the locking sleeve when passed thereover and moved to locking position.

4,006,923

COUPLING CONSTRUCTION

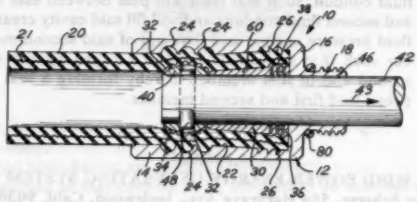
John B. Wagner, 33-9th St., Racine, Wis. 53233

Filed Oct. 29, 1975, Ser. No. 626,969

Int. Cl.² F16L *33/20*

U.S. Cl. 285—39 **9 Claims**

1. In a hose coupling comprising a body having a cylindrical chamber with an open end for telescoping over an end of a hose and an end wall at the other end of said chamber, and a tubular pressure element in said chamber having an inner end portion of deformable material, said deformable end portion being deformed so as to cause the aligned portion of the hose to be firmly squeezed and displaced against the cylindrical wall of the chamber of said body to firmly secure the body, the hose, and the pressure element in fixed relation to each other, the inner cylindrical wall of said chamber and the external surface of said pressure element, outwardly of the deformable inner end portion, being dimensionally related to provide an axially tapering annular space, converging toward the end wall of the body, which is less than the thickness of the wall of the hose to which the hose coupling is supplied, a portion of the pressure element outwardly of said deformable inner end portion being tapered and having a surface increasing in diameter toward the end wall of said body, and the maximum diameter of said tapered portion being greater than the nor-



mal internal diameter of the hose to which the coupling is applied, the inner cylindrical wall of said chamber being provided with a first plurality of grooves spaced from the end wall and located in transaxial registration with said deformable inner end portion of said pressure element, into which the material of the hose is caused to flow incident to affixing the pressure element within the body, the outer surface of the deformable inner end portion being provided with a plurality of first grooves remote from the end wall, the improvement comprising a collapsible wall portion on the tapered portion of the pressure element adjacent the end wall of the body and a second plurality of grooves in the inner cylindrical wall adjacent the end wall of the body, the collapsible wall portion defining ridges when collapsed to cause hose material to flow into the second grooves and thereby provide secondary means for securing and sealing the hose relative to the body.

4,006,924

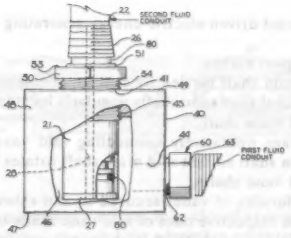
SWIVEL OR ROTATING COUPLING

Audley V. Spencer, 5001 S. "C", Oxnard, Calif. 93030

Filed Oct. 14, 1975, Ser. No. 621,871

Int. Cl.² F16L *5/00, 27/00, 41/00*

U.S. Cl. 285—190 **4 Claims**



1. A coupling means coupled to at least a first fluid conduit and having a cavity therein in fluid communication with said first fluid conduit, said coupling means comprising:

a. a first member having a tubular body and a first and second end, said first end coupled to said coupling means and said second end disposed within said cavity and forming a sealing surface;

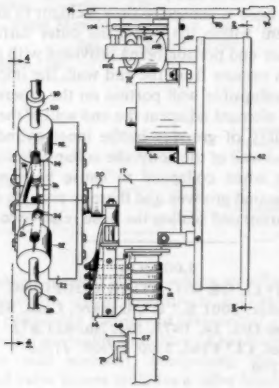
b. a second member having an elongated cylinderical body with a longitudinal bore extending therethrough, said second member having a first and second end, said first end being larger in diameter than said body, such that an annular collar is formed at the point of change in diameters, the side of the collar adjacent the body of the second member comprising a second sealing surface, said body of said second member having an outer diameter slightly smaller than the inner diameter of said body of said first member, said second member disposed within said first member, such that said first end is disposed near said second end of said first member, said second end of said second member coupled to a second fluid conduit, said second fluid conduit capable of being rotated in relation to said first fluid conduit, said longitudinal bore being in fluid communication with said cavity and said second fluid conduit, such that fluid will pass between said first and second fluid conduits and will fill said cavity creating fluid pressure against said first end of said second member such that said annular collar is urged against said second end of first member thereby forming a seal between said first and second member.

4,006,925

WIND POWER ENERGY GENERATING SYSTEM

Peter Scherer, 554 Hargrave Ave., Inglewood, Calif. 90302

Filed Aug. 15, 1974, Ser. No. 497,696
Int. Cl.² F03D *9/00*
U.S. Cl. 290—55 **24 Claims**



1. A wind driven electric energy generating apparatus comprising:

a. support means,

b. a main shaft carried by said support means,

c. a plurality of vane shafts angularly located with respect to said main shaft,

d. means operatively connecting said vane shafts to said main shaft so that said main shaft rotates with rotation of said vane shafts,

e. a plurality of vanes secured to and extending outwardly from respective ones of said vane shafts to cause rotation of said main shaft when the vanes are driven by a wind,

f. electric energy generating means operatively connected to said main shaft and being operable thereby to generate electric energy pursuant to rotation of said shaft, said electric energy generating means comprising a field winding and a flux operable shaft cooperating therewith,

g. first speed control means operatively mechanically associated with said vane shafts and coupling each of said vane shafts to one another to prevent rotation of said vanes and said vane shafts and main shaft beyond a maximum threshold velocity of rotation, and

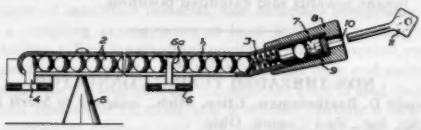
h. second speed control means operatively associated with said main shaft and having a rotatable member operatively rotatable thereby, said second speed control means operatively connected to said field winding of said electric energy generating means to prevent energy generation of said field winding and thereby prevent operation of said generating means if said main shaft and said vanes do not meet a minimum threshold velocity of rotation.

4,006,926

FASTENING DEVICE FOR WINGS, SPECIALLY FOR WINDOWS OR DOORS

Stig Bertil Börebäck, S-24013 Genarp, Sweden

Filed June 18, 1975, Ser. No. 587,999
Int. Cl.² E05C *17/04*
U.S. Cl. 292—262 **4 Claims**



1. A fastening device for a wing, to permit lockable closure and lockable holding of said wing in at least one opened position relative to a stationary part, which device comprises an arm having a profile which forms a channel and at the underside has a longitudinal slot in communication with the channel; means for pivotally connecting one end of said arm to said wing; a plurality of locking members placed in a row in the channel of said arm and movable in the channel longitudinally of said arm; a screw spindle axially screwed into the other end of said arm; a key for turning said screw spindle; a compression spring placed in the channel of said arm between said locking members and said screw spindle and acting in the longitudinal direction of said arm; two latches one of which is adapted for mounting on said stationary part and the other on said wing; and a portion formed on each of said latches and introducible through said slot upwardly into said channel between two adjacent locking members, to move said two adjacent locking members apart against the action of said compression spring, and having an engagement surface which, upon introduction of said portion between said two adjacent locking members, is adapted to engage at least one of said two adjacent locking members, said portion being arrestable in the portion in which said engagement surface engages said locking members, by such turning movement of the screw spindle with the aid of the key that the spring action is abolished.

4,006,927

DOOR HANDLE ATTACHMENT

Thomas A. Recupero, 31 Marron Ave., Stoughton, Mass. 02072

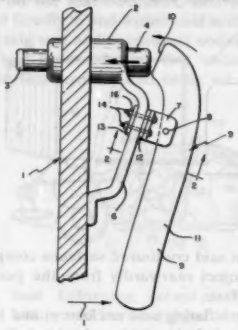
Filed Dec. 10, 1975, Ser. No. 639,462
Int. Cl.² E05C *13/00*
U.S. Cl. 292—336.3 **4 Claims**

1. An attachment for a door latch housing having a hand grip and an external latch actuator comprising

a bracket,

a lever pivotally mounted on the bracket, and means on the bracket for clamping the bracket to the hand grip with one end of the lever opposed to the plunger and the other

end extending below the hand grip so that pulling on the other end engages said one end with the actuator so as to



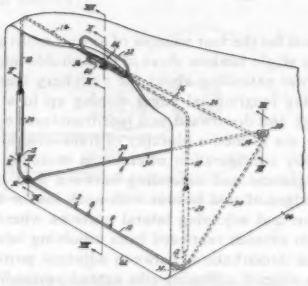
unlatch and open the door, wherein the lever pivots in a plane common to the door handle and latch actuator.

4,006,928

LAWN BAG CADDY

Louis E. Beugin, 2910 S. Hawthorne, Independence, Mo. 64052

Filed Dec. 10, 1975, Ser. No. 639,234
Int. Cl.² B65B 67/12; B65F 1/04
U.S. Cl. 294—1 R 6 Claims



1. A lawn bag caddy comprising:

a. an open, generally rectangular frame adapted to be inserted snugly into the mouth of a lawn bag, adjacent and with its plane generally parallel to the plane of the bag mouth opening, said frame when disposed in a vertical plane having generally parallel upper and lower legs and generally parallel side legs, and

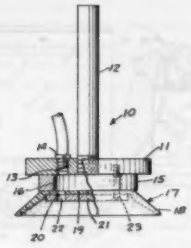
b. supporting means connected to said frame and operable, when supported on the ground, to support said frame in an approximately vertical plane with its lower leg at ground level, said supporting means constituting a stand comprising a generally planar base member secured at one edge to lower leg of said frame and extending from said frame at approximately right angles to the plane thereof, and a diagonal strut secured at one end to the extended end of said base member and at its opposite end to the upper leg of said frame.

4,006,929

VACUUM PAD

Loren B. Barker, Salem, Ill., assignor to American Chain & Cable Company, Inc., Bridgeport, Conn.

Filed Dec. 17, 1975, Ser. No. 641,498
Int. Cl.² B66C 1/02
U.S. Cl. 294—64 R 3 Claims



1. In a vacuum pad, the combination comprising

a body,

said body having an opening therethrough,

one end of said opening being adapted to be attached to a source of vacuum,

an annular member associated with said body and defining a water trap chamber communicating with said opening,

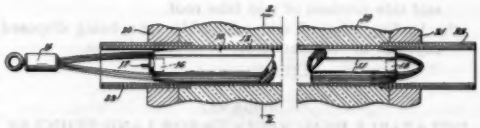
and a cup of flexible material having a peripheral lip and a central portion mounted on said chamber defining means and having a plurality of circumferentially spaced openings through said central portion providing communication between the interior of said water trap chamber and the space surrounded by said lip.

4,006,930

MANIPULATOR FOR HOLLOW OBJECTS

William E. Cawley, and Charles E. Frantz, both of Richland, Wash., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Mar. 15, 1961, Ser. No. 96,051
Int. Cl.² A25B 11/00
U.S. Cl. 294—93 3 Claims

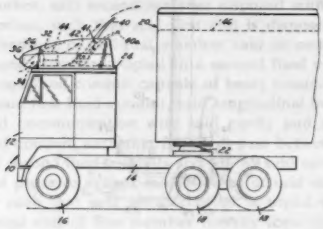


1. A device comprising a rubber tube closed at one end and having means at the other end for admitting pressure fluid to expand the rubber tube, and a plurality of parallel cables lodged in the exterior of the tube so as to protrude slightly therefrom, extending longitudinally of the rubber tube throughout the length thereof, and being equally spaced from one another about the exterior of the rubber tube so as to define substantial circumferential spaces between said cables for the full length of said tube, said cables being flexible to permit substantial flexure of said device.

4,006,931
DEVICE FOR REDUCING WIND RESISTANCE OF A VEHICLE

Donald W. Groves, Birmingham, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Sept. 11, 1974, Ser. No. 505,121
Int. Cl.² B62D 39/00
U.S. Cl. 296—1 S 1 Claim



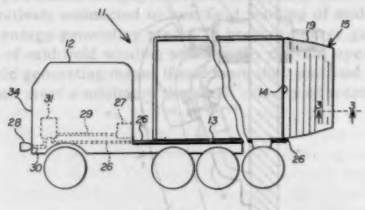
1. A device for reducing the wind resistance of a vehicle having a forward vehicle roof and a vertical body portion situated rearwardly and above said roof,
a false roof having a transverse portion and depending side portions,
said side portions having a greater longitudinal length than said transverse portion,
said side portions of said false roof being joined to said vehicle roof adjacent the lateral edges of said vehicle roof,
the leading edge of said transverse portion being spaced forwardly and upwardly of the leading edge of said vehicle roof,
said transverse portion of said false roof being spaced apart from said vehicle roof and cooperating therewith to define an air-flow channel,
an adjustable air deflector vane extending transversely between said side portions of said false roof,
said adjustable vane extending upwardly and rearwardly and constructed to direct air flowing through said channel in a direction over the top of said vertical body portion,
adjustment means supporting said adjustable vane relative to said false roof and constructed to provide means for adjusting the angle of inclination of said adjustable vane,
said adjustable vane having an upper portion that extends upwardly above said transverse portion of said false roof whereby said adjustable vane deflects air flowing over said transverse portion as well as through said channel,
an air conditioning unit supported on said vehicle roof in said air flow channel,
said false roof being constructed to direct the flow of air around said air conditioning unit,
a fixed air deflector vane extending transversely between said side portions of said false roof,
the leading edge of said adjustable vane being disposed adjacent to and rearwardly of said fixed vane.

4,006,932
INFLATABLE DRAG REDUCER FOR LAND VEHICLES

Alan T. McDonald, West Lafayette, Ind., assignor to The United States of America as represented by the Secretary of the Department of Transportation, Washington, D.C.

Filed July 21, 1975, Ser. No. 597,557
Int. Cl.² B62D 35/00
U.S. Cl. 296—1 S 7 Claims

1. A vehicle comprising:
a front end that leads said vehicle during normal movement thereof;
a rear end with a substantially planar surface that trails said vehicle during normal movement thereof;
an inflatable enclosure secured to said rear end, said enclosure when inflated having convergent contoured surfaces extending from the edges of said planar surface and further comprises a substantially flat rear surface spaced from said planar surface and connected to said contoured

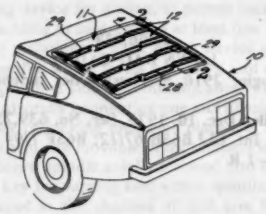


surfaces; wherein said contoured surfaces comprise cusp portions that project rearwardly from the periphery of said flat rear surface;
inflation means for inflating said enclosure; and
deflation means for deflating said enclosure.

4,006,933
UNITARY SUNSHIELD FOR AN AUTOMOBILE

Elwood J. Simpson, 29075 Clevis, Rancho Palos Verdes, Calif. 90274

Filed May 17, 1976, Ser. No. 687,362
Int. Cl.² B60J 1/20
U.S. Cl. 296—95 R 8 Claims



1. A sunshield for the rear window of an automotive vehicle formed from a single laminar sheet of deformable material to provide a border extending about the periphery thereof and having opposing longitudinal edges sloping up to a forward transverse edge and downward to a rear transverse edge; and wherein there are formed a plurality of transverse louvers of generally planar configuration oriented in mutually parallel horizontal alignment and extending between said opposing longitudinal edges of said border with each louver having a central portion and adjoining lateral portions wherein each central portion extends rearward from adjoining lateral portions to define demarkations between adjacent portions and longitudinally aligned stiffening ribs extend vertically downward from each louver at said demarkations to join with the remaining structure of said sheet to define a plurality of transverse apertures in said sheet in association with each portion of each louver below and to the rear thereof.

4,006,934
SEAT FOR AUTOMOBILE

Hisakazu Murakami, and Yasuhiko Fujiwara, both of Yokohama, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Continuation-in-part of Ser. No. 447,367, March 1, 1974, abandoned. This application July 2, 1975, Ser. No. 592,798
Claims priority, application Japan, Mar. 2, 1973, 48-25496
Int. Cl.² A47C 31/00
U.S. Cl. 297—386 7 Claims

1. In a motor vehicle having a seat including a generally horizontal portion and a back supporting portion, said seat

being mounted to the motor vehicle so that it will slide adjustably in the longitudinal direction thereof, the combination with said seat, of a harness and a means for tightening said harness on the seat occupant, said tightening means being mounted fixedly to and within said seat and said harness being fixed to said seat and operatively connected to said tightening means, said harness having first, second, and third terminal ends said first terminal end being secured to said horizontal

portion, said tightening means including a first means mounted within said horizontal portion and so constructed as to normally hold the second terminal end stationary relative to the seat; and a second means mounted within said back supporting portion and so constructed as to normally hold the third terminal end stationary relative to the seat, each of said first and second means being adapted to tighten said harness on the seat occupant.

4,006,935

MINING MACHINES

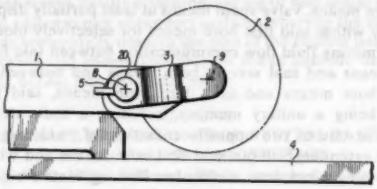
Terence John Gapper, Duffield; George Thomas Addison, and David Arthur Tate, both of Burton-on-Trent, all of England, assignors to Coal Industry (Patents) Limited, London, England

Filed May 19, 1975, Ser. No. 578,868

Claims priority, application United Kingdom, May 17, 1974, 22036/74

Int. Cl.² E21C *25/10*

U.S. Cl. 299—1 **5 Claims**



1. A mining machine, comprising: a body; an arm mounted to said body for pivotal movement relative to said body about a first substantially horizontal axis; a rotary cutter drum carried by said arm and mounted for rotation about a second substantially horizontal axis; sensing means, including a rotary sine-cosine potentiometer means coupled to said arm for sensing a displacement of said arm corresponding to the height of said second axis relative to a plane containing said first axis, said potentiometer means generating a signal directly related to the sensed relative height; a first member secured to said arm and having an annular bearing surface; a second member engaging said annular bearing surface of said first member, said first member being rotatable relative to said second member; said potentiometer having a rotating spindle, said potentiometer being mounted to said second member such that said spindle is co-axial with said first axis; and a further arm secured to said spindle and engaging said first member to rotate said spindle through an angle substantially equal to angular movement of said arm.

4,006,936

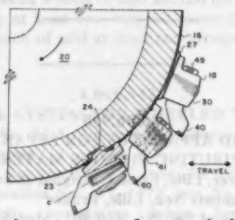
ROTARY CUTTER FOR A ROAD PLANER

Wesley Irving Crabiel, Galion, Ohio, assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Nov. 6, 1975, Ser. No. 629,341

Int. Cl.² E21C *47/00, 35/18*

U.S. Cl. 299—39 **25 Claims**



1. An improved rotary cutter for a road planing machine suitable for cutting a path in hardened paving materials such as asphalt, concrete, or the like, comprising:

a cylindrical drum adapted to be suspended from a surface engaging vehicle on a generally horizontal axis of rotation;

a plurality of bit holders attached to the periphery of the drum, each of the holders having a tapered socket extending through the holder along an axis spaced from and generally tangential to the drum surface; and

a plurality of cutter bits, each having a body portion including a cutting tip and shoulderless shank extending along an axis generally perpendicular to the cutting face of the cutting tip, wherein said bit shank is tapered along its axis corresponding to the taper in the socket of the bit holders and is sized such that when the bit is inserted in its respective bit holder it will seat snugly on its tapered shank in the socket of the holder,

whereby the cutting forces imposed on said bits when the rotary cutter is cutting a paved surface act tangential to the drum surface and generally along the axis of the bit shank to hold it in snug engagement with the bit holder without the need for any positive locking means to hold the bit in place.

4,006,937

CARRIAGE ESPECIALLY FOR USE IN MINES

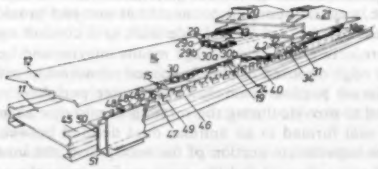
Brian Matthew Curtis, Scarcliffe, England, assignor to Perard Engineering Ltd., England

Filed Jan. 31, 1975, Ser. No. 546,041

Claims priority, application United Kingdom, Feb. 2, 1974, 4927/74

Int. Cl.² E21C *29/04*

U.S. Cl. 299—43 **7 Claims**



1. A frame for a mineral winning machine, the frame having a drive mechanism for mounting and driving a continuous chain engageable with a rack for driving the machine along the rack, the drive mechanism comprising drive means mounted for rotation about a vertical axis, the drive means being adapted for engagement with a continuous link chain having adjacent links in relatively perpendicular planes by

provision of teeth which engage the outer perimeters of the links, guide members for the chain and arranged so as to deflect the chain perpendicularly to the plane of the drive sprocket, a pair of the guide members being spaced lengthwise of the frame, and deflection means between the guide members of the pair and arranged to deflect the chain downwardly below the guide members to engage the rack.

4,006,938

METHOD AND APPARATUS FOR SEPARATING AND DISTRIBUTING FIBROUS MATERIALS

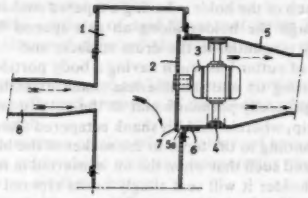
Ferdinand Reiterer, Lille, France, assignor to Societe Anonyme des Establissements Neu, Lille, France

Continuation of Ser. No. 450,801, March 13, 1974, abandoned. This application Aug. 27, 1975, Ser. No. 608,203

Claims priority, application France, Mar. 19, 1973, 73.10223

Int. Cl.² B65G *53/60*

U.S. Cl. 302—59 **6 Claims**



1. Apparatus for separating and collecting fibrous material from a pneumatically conveyed air-fibrous material mixture, comprising, in combination, storage means having a side wall defining an interior for storing fibrous material, said storage means being provided with an inlet and an outlet in said side wall, a flat disc mounted for rotation on a horizontal axis in said storage means interior adjacent said outlet, said disc having a perforated portion provided with a plurality of perforations extending radially outward from said axis and terminating radially inward of the outer periphery of said disc and an imperforate, annular edge portion on said disc extending circumferentially between said perforated portion and said disc outer periphery, means for rotating said disc, conduit means connected to said storage means inlet for conducting the pneumatically conveyed air-fibrous material mixture into said storage means interior along a path normal to said disc for impingement of said air-fibrous material mixture on said rotating disc, a suction conduit connected at one end to said storage means outlet and to said side wall, said conduit one end edge projecting into said storage means interior and being at an end edge disposed in closely spaced relationship with said imperforate portion inwardly of the outer periphery of said disc and to provide during the rotation of said disc an aerodynamic seal formed in an annular duct defined between said annular imperforate portion of the rotary disc, the inner surface of said side wall and the outer surface near the edge of said suction conduit, pneumatic suction means associated with said suction conduit for drawing the air from said air-fibrous material mixture impinging on said rotating disc through said disc perforated portion and to permit the fibrous material in the mixture from which said air is drawn to be deposited in said storage means with the passage of air between said rotating disc and said edge of said suction conduit one end being prevented by said aerodynamic seal.

4,006,939

AIR PRESSURE MODULATED BRAKE VALVE SYSTEM

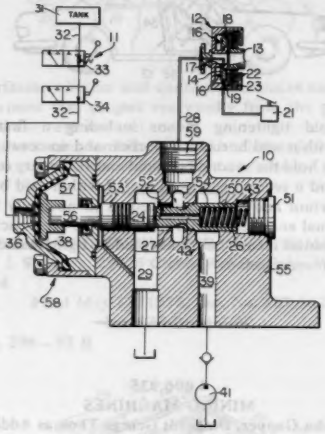
Lawrence Francis Schexnayder, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 31, 1975, Ser. No. 545,856

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.² B60T *13/22*

U.S. Cl. 303—71 **9 Claims**



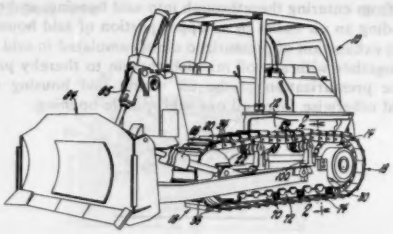
1. Modulating valve means for modulating the pressure of the operating fluid of a fluid pressure operated brake mechanism, said valve means including; a housing block, said housing block including first bore means and second, third, and fourth bore means in direct fluid communication with said first bore means, valve spool means at least partially disposed movably within said first bore means for selectively blocking and permitting fluid flow communication between said fourth bore means and said second bore means and between said fourth bore means and said third bore means, said spool means being a unitary member including a rod extension portion at one of two opposite ends thereof, said extension portion extending without said first bore means and without said housing block into a chamber housing means adjacent said housing block, said chamber housing means including first and second chambers separated by resilient diaphragm means, said resilient diaphragm means being in direct engagement with said extension portion of said unitary member, said chamber housing means including inlet passage means for communicating said first chamber with a regulatable source of secondary fluid under pressure, said modulating valve means performing the function of modulating the pressure of said operating fluid in response to the pressure of said secondary fluid in said first chamber, said modulating valve spool means unitary member having first and second opposite end portions, said first end portion being contiguous with said rod extension portion and said second end portion being disposed within a spring-pressure chamber at one end of said first bore means, said valve spool means unitary member including passageway means for constantly communicating said spring-pressure chamber with said fourth bore means, said spool means unitary member being urged in a first direction by the pressure extent in said spring-pressure chamber and being urged in a second opposite direction by said secondary fluid pressure extant in said first chamber.

4,006,940

ROLLER FRAME FOR CRAWLER TRACTOR

Francis J. Halterman, Jr., Ravenna, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 8, 1976, Ser. No. 647,358
Int. Cl.² B62D *25/16*
U.S. Cl. 305—12 **3 Claims**



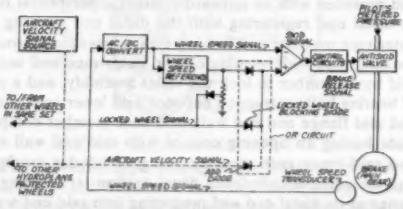
1. A roller frame for a crawler tractor having a body portion each side of which is provided with a drive sprocket and an endless track composed of a plurality of track shoes interconnected by pivot pins, said roller frame adapted to support said body portion on the lower run of said endless track and comprising a pair of laterally spaced side plate members rigidly interconnected to form an elongated unitary member having a front end and a rear end, an idler wheel rotatably supported by the front end of the roller frame between the side plate members, pivot means for connecting the rear end of the roller frame to said body portion, each of said side plate members having an upper edge and a lower edge, said lower edge having at least two cut-out portions formed therein so as to provide said each of said side plate members with a front support surface and an intermediate support surface and a rear support surface, said front, intermediate and rear support surfaces being located in a common vertical plane, a plurality of rollers rotatably supported in each of said cut-out portions, a shield extending between each adjacent pair of support surfaces and being L-shaped in crosssection so as to provide a pair of legs located in mutually perpendicular planes, and fastener means fixedly attaching one leg of said shield directly to said adjacent pair of support surfaces whereby the other leg extends horizontally towards the pins of the endless track so as to enclose said rollers and prevent rocks and the like from gaining access into the roller frame.

4,006,941

AIRCRAFT BRAKE CONTROL SYSTEM HAVING HYDROPLANING PROTECTION

Garrett H. DeVlieg, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 535,010, Dec. 20, 1974, abandoned. This application Jan. 8, 1976, Ser. No. 647,387
Int. Cl.² B60T *8/10*
U.S. Cl. 303—103 **3 Claims**



3. In combination in an aircraft having brakes for at least two groups of wheels:

hydraulic circuit means for applying brake pressure to said brakes of said at least two groups of wheels, each group including at least two wheels;

antiskid circuit means for controlling brake pressure at said wheels in said at least two groups in response to a skidding condition of said wheels in said at least two groups;

said antiskid circuit means in each of said at least two groups of wheels including locked wheel protection circuit means;

said locked wheel protection circuit means providing a locked wheel protection signal to a first wheel upon rotation of a further wheel; and

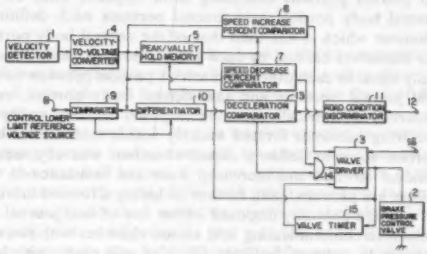
means responsive to the velocity of said aircraft during lock up of all braked wheels of said aircraft for releasing brake pressure to at least one but not more than half of the wheels in each of said at least two groups of wheels.

4,006,942

ANTILOCK SYSTEM FOR WHEELED VEHICLES

Masashi Saito, No. 11-1, 3-chome, Kasugadai, Aikawa, Aiko, Kanagawa, Japan

Continuation of Ser. No. 500,087, Aug. 23, 1974, abandoned. This application Nov. 17, 1975, Ser. No. 632,820
Claims priority, application Japan, Sept. 14, 1973, 48-104085; Apr. 25, 1974, 49-46835; May 28, 1974, 49-59985
Int. Cl.² B60T *8/10, 8/08*
U.S. Cl. 303—109 **10 Claims**



1. A brake control system for an automotive vehicle for preventing skids resulting from early locking of the vehicle's wheels comprising:

a. a first means for generating a first signal voltage representing the vehicle's wheel velocity;

b. a second means for continuously generating a second signal, said second signal representing an extremum of said first signal;

c. a driving means for generating a signal for controlling a brake pressure control valve to release and reapply brake pressure;

d. a connecting means in circuit with said second means and said driving means for causing said second means to switch said second signal between values corresponding to maximum and minimum values of said first signal responsive to said driving means signal; and

e. a comparing means for comparing said first and second signals and for providing a signal for operating said driving means.

4. A method for preventing skidding of automotive vehicles due to premature locking of brakes comprising of the steps of:

a. providing a first signal proportional to a vehicle's wheel velocity;

b. providing a brake-relief signal in response to said first signal dropping more than a first fixed percentage from a peak value thereof;

c. removing said brake relief signal in response to said first signal increasing more than a second fixed percentage from a minimal value thereof;

d. generating the minimal value of said first signal in response to the application of said brake relief signal; and

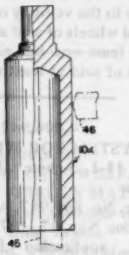
e. generating the peak value of said first signal in response to the removal of said brake-relief signal.

4,006,943

FORMED ONE-PIECE HOLLOW ROLLER SHAFT

Lawrence W. Gibble, and Dennis Lee Keesey, both of York, Pa., assignors to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 421,120, Dec. 3, 1973, Pat. No. 3,927,449.
This application Sept. 8, 1975, Ser. No. 611,194
Int. Cl.² F16C 1/24
U.S. Cl. 308—103 4 Claims



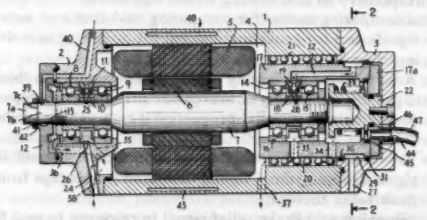
1. A formed, hollow roller shaft of integral, one-piece construction comprising an elongated member having a cylindrical central body portion defining a first diameter and cylindrical journal portions extending from opposite ends of said central body portion, said journal portions each defining a diameter which is less than that of the central body portion, the diameters defined by each journal portion being substantially equal to each other, a transition portion between each of said journal portions and said central body portion, and a generally cylindrical, centrally disposed internal cavity for receiving lubricant formed entirely within said central body portion so as to define a closed chamber, whereby reduced residual stresses and increased wear and resistance to load failure are provided, and further including a formed lubricant fill passage centrally disposed within one of said journal portions intercommunicating said closed chamber with the shaft exterior in order to facilitate filling of said cavity with lubricant, and the other of said journal portions being free from cavities.

4,006,944

SPINDLE DEVICE HAVING BEARINGS LUBRICATED WITH OIL JET

Shigenori Ando; Masato Ota, and Tadashi Kawashima, all of Narashino, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Japan

Filed Aug. 4, 1975, Ser. No. 601,428
Claims priority, application Japan, Aug. 2, 1974, 49-92444[U]
Int. Cl.² F16C 1/24
U.S. Cl. 308—187 8 Claims



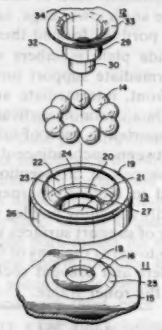
1. A spindle device with oil jet lubrication comprising: a housing having front and rear portions; a spindle disposed within said housing and having a nose portion protruding through a spindle opening in the housing front portion; bearings rotatably supporting said spindle in said housing; oil jet lubricating means for effecting oil jet lubrication of said bearings with pressurized lubricating oil, said means comprising an oil inlet in said housing for receiving pressurized lubricating oil, oil jet nozzles connected to said oil inlet and facing said bearings to jet oil thereon, and an oil outlet in a lower portion of said housing for enabling the drawing off of the jetted oil; air circulating means for circulating pressurized air past said spindle opening in said housing to seal said opening to prevent dust from entering therethrough into said housing; and means including an air outlet in an upper portion of said housing to effect exhaustion of pressurized air accumulated in said housing together with any oil mingled therein to thereby prevent undue pressurization of the air within said housing which would otherwise force oil out said spindle opening.

4,006,945

ROLLER BEARING ASSEMBLY

Michael Sekerich, Spring Valley, N.Y., assignor to Bulldex Incorporated, West Nyack, N.Y.

Filed Mar. 6, 1975, Ser. No. 555,793
Int. Cl.² F16C 33/00
U.S. Cl. 308—191 7 Claims

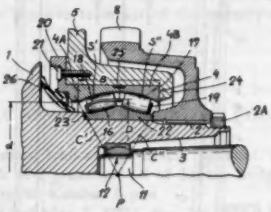


1. A roller assembly comprising a base member, a roller defining tubular outer race member having a centrally apertured proximal end wall proximate said base member and being open at its distal end and having an outer race defining inside peripheral face, an inner race member coaxial with said outer race member and having an inner race defining peripheral outside face confronting and spaced from said outer race and provided with an outwardly directed peripheral flange at its distal end registering with the distal end opening of said outer race member and locking means extending through said proximal end wall opening of said outer race and secured to said base member to lock the roller assembly, and a plurality of bearing balls entrapped between said inner and outer races and said flange and end wall, said base member comprising a plate having an opening coaxial with said end wall aperture and said inner race member being of tubular configuration and including a cylindrical distal section terminating in said flange at its distal end and projecting into said end wall aperture and a cylindrical proximal section of a diameter less than that of said distal section and joined to said distal section by a peripheral shoulder engaging the forward peripheral border of said base member opening, the end of said proximal section being upset into engagement with the rear peripheral border of said base member.

4,006,946
SWING MOUNTING FOR CEMENT MIXER AND THE LIKE

Egon Mann, and Manfred Fischer, both of Friedrichshafen, Germany, assignors to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Germany

Filed Aug. 22, 1975, Ser. No. 606,945
Int. Cl.² F16C *21/00*
U.S. Cl. 308—194 8 Claims

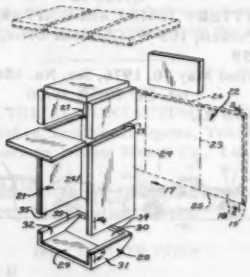


1. A mounting for a load shaft driven from a prime mover through a transmission in a housing with freedom of limited nutation about a predetermined reference point on the shaft axis, comprising an annular inner race with two concave raceways secured to said load shaft, an annular outer race fixedly secured to said housing and axially split into two halves each having a toroidal inner surface with arcuate generatrices curved about said reference point, and two sets of barrel-shaped rollers respectively interposed between the guide surfaces of said halves and the raceways of said inner race, said outer race being of substantially greater axial width than said inner race for keeping said rollers confined upon a relative swing of said races to either side of a mid-position.

4,006,947
LINER AND INSULATION STRUCTURE FOR REFRIGERATION APPARATUS

Charles Walter Haag, and Samuel Joseph Pearson, both of Evansville, Ind., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Nov. 7, 1975, Ser. No. 629,874
Int. Cl.² F25D *17/04*; B65D *25/14*
U.S. Cl. 312—214 16 Claims

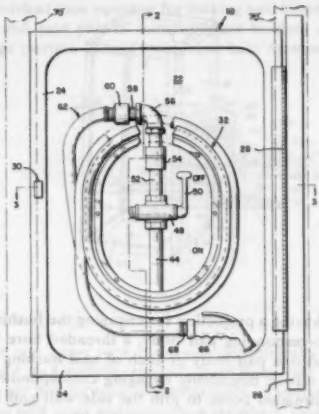


1. In a refrigeration apparatus having an exterior cabinet, an improved liner and insulation structure comprising: a base having a formed bottom, and side and rear portions defining a generally upward facing abutment surface; and an upright wall structure formed of a folded laminate of an inner sheet-like liner and an outer insulation, said wall structure having a lower edge portion resting on said base abutment surface to define therewith within said cabinet at least a portion of the interior refrigerated space of said refrigeration apparatus.

4,006,948
FIRE HOSE CABINET

William B. Kessinger, Box 156, Beech Creek, Pa. 16822

Filed Jan. 23, 1976, Ser. No. 651,826
Int. Cl.² A47B *67/02*; B05B *75/36*
U.S. Cl. 312—242 2 Claims



1. A cabinet for mounting a fire hose or the like comprising a cabinet body having side walls and a rear wall; a door attached to a side wall by a hinge for closing the front of the cabinet; a hose-receiving spool mounted on the rear wall within the body and including an interior opening, a rounded wrapping portion having a smooth exterior surface extending from the rear wall toward the door, opposed sections of the exterior surface diverging from each other away from the rear wall, inwardly directed mounting means on the edge of the wrapping portion adjacent the rear wall and secured thereto, and an outwardly directed hose-retaining flange on the edge of the wrapping portion away from the rear wall; an on-off valve mounted within the interior opening adapted to be connected to a water line; an outlet water line extending from said valve through an opening in the spool to an elbow located outwardly of the exterior surface of the wrapping portion; a swivel in the outlet line between the valve and elbow; and a hose, one end of the hose being secured to the elbow, a nozzle secured to the other end of the hose, hose loops wrapped around the exterior surface of the wrapping portion, said flange extending a distance from exterior surface equal to approximately one half the diameter of the hose and including a rounded edge facing the rear wall to facilitate rapid removal of the hose from the spool.

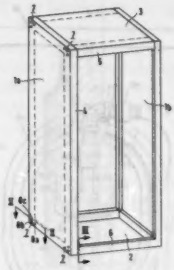
4,006,949
CABINET FOR MOUNTING ELECTRONIC EQUIPMENT

Roman Keller, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Mar. 22, 1973, Ser. No. 343,955
Claims priority, application Germany, Mar. 24, 1972, 2214538
Int. Cl.² A47B *48/00*
U.S. Cl. 312—263 1 Claim

1. A cabinet for mounting electronic equipment comprising:
a. side walls;
b. a bottom end part;
c. a top end part, the side walls and the end parts of an assembled cabinet cojointly defining respective cabinet corners;
d. a plurality of joints located at said corners each of said joints comprising three bushing pairs arranged to define the respective corners of a triangle, each bushing pair consisting of a first pair body and a second pair body, the

first pair body fixedly mounted in the side wall corresponding to the joint and the second pair body fixedly mounted in the end part of the cabinet corresponding to the same joint, one of the pair bodies of each of said bushing pairs having a bushing bore formed therein, the other one of said paired bodies of each of said bushing



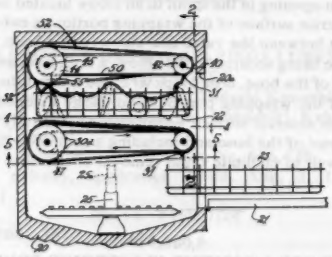
pairs having a projection for engaging the bushing bore of the corresponding pair body, a threaded bore formed in at least one pair body of each of said bushing pairs and three screws threadably engaging corresponding ones of said threaded bores to join the side wall and the corresponding one of said end parts together.

4,006,950

DISH-STABILIZERS FOR DISH WASHING MACHINES

James M. Murray, 9129 S. Crescent Court, Oak Lawn, Ill. 60453

Filed Feb. 14, 1975, Ser. No. 550,004
Int. Cl.² B08B *11/00*; A47L *15/00*, *15/50*
U.S. Cl. 312—270 **3 Claims**



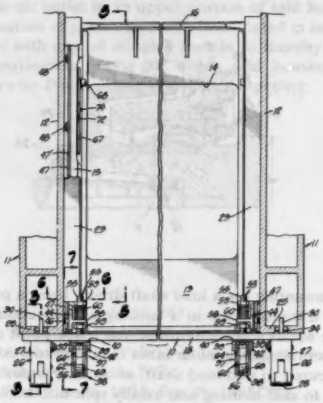
1. A stabilizer for dishes contained in a workbasket of a dishwashing machine to maintain them therein as deposited and apart from each other comprising a limp mesh having a length greater than that of the work basket and adapted to be lowered into the work basket when same is inserted into said machine and to be lifted from and supported above said work basket when same is removed from said machine and conveyor means to support and to move the mesh into and out of said work basket, said conveyor means comprising a pair of co-operating differentially-driven conveyors and drive means between the work basket and one of said conveyors to advance one end of the mesh at the speed of the work basket movement and the opposite end of the mesh at a faster speed to impose a gradual draping of the mesh into said work basket upon its insertion and to quickly lift said mesh from said work basket upon its withdrawal.

4,006,951

LOCKING MECHANISM FOR A SLIDE DRAWER

Larry A. Geer, Upland, and Ralph L. Sheffer, Arcadia, both of Calif., assignors to Adams Rite Products, Inc., Glendale, Calif.

Filed June 12, 1975, Ser. No. 586,291
Int. Cl.² A47B *88/16*
U.S. Cl. 312—320 **17 Claims**



1. In the combination of a cabinet and a drawer supported for movement between an open extended position projecting from a side of the cabinet and a closed retracted position within the cabinet, the improvement comprising:

a. means supporting the drawer on said cabinet for guided movements between said open and closed positions, and said supporting means comprises side rails carried by said drawer, and guide rails carried by said cabinet respectively operatively associated with each of said drawer side rails; and

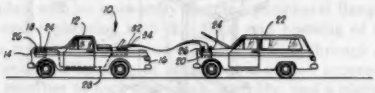
b. lever actuated means operable in open, closed, and an infinite number of intermediate positions of said drawer of retaining and holding the drawer against vibrational movements said retaining and holding means including means engageable between a drawer side rail and an associated cabinet rail for releasably anchoring said rails against relative movements.

4,006,952

BATTERY JUMP CABLE APPARATUS

William E. Puckett, 105 W. Charlotte Drive, Oklahoma City, Okla. 73159

Filed May 10, 1976, Ser. No. 684,652
Int. Cl.² H01R *39/00*
U.S. Cl. 339—5 RL **10 Claims**



1. Apparatus for transferring power from the battery, having positive and negative terminals, of a service vehicle to the battery, having positive and negative terminals, of a second vehicle where the negative terminal of the service vehicle battery is connected to the frame of the service vehicle, comprising:

a housing secured to the service vehicle;

a reel rotatably supported in the housing;

a first cable wound on the reel having one end thereof secured to the reel and an opposite free end;

means electrically connecting the end of the first cable connected to the reel to the frame of the service vehicle;

a clamp connected to the free end of the first cable for connection with the negative terminal of the battery of the second vehicle;

a second cable wound on the reel having one end thereof connected to the reel and an opposite free end;

means electrically connecting the end of the second cable connected to the reel to the positive terminal of the service vehicle battery; and

a clamp on the free end of the second cable for connection with the positive terminal of the battery of the second vehicle

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4,006,953

SPINDLE ASSEMBLY HAVING AN ELECTRODE SPINDLE

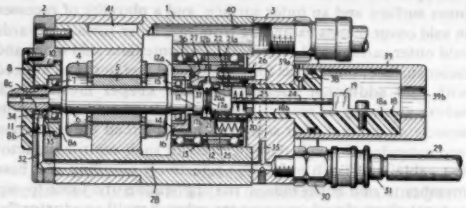
Sadao Moritomo, Ichikawa; Shinichi Kikuchi, and Shigenori Ando, both of Narashino, all of Japan, assignors to Seiko Seiki Kabushiki Kaisha, Japan

Filed May 7, 1975, Ser. No. 575,130

Claims priority, application Japan, May 7, 1974, 49-51389[U]; May 10, 1974, 49-52081

Int. Cl.² H01R *39/00*

U.S. Cl. 339—6 R **11 Claims**



1. A spindle assembly for electrolytic grinders and others which use electric current through rotating spindles, comprising an electrode spindle supported rotatably in a housing, said spindle being insulated from the housing, an electric current collector securely fixed on the rear end of said spindle, a slipping brush member spaced behind said electric current collector and being in contact with the collector, said brush member being also insulated from the housing and connected to an electric supply during use of the spindle assembly, and means including air circulating paths formed in the combination of said electric current collector and said slipping brush member for sucking air from outside to circulate through the paths returning to the outside, so that wear material from the brush member is ejected out together with the circulating air.

4,006,954

ELECTRICAL CONTACTING DEVICE

Kazuo Ikawa, Tokyo, and Naoki Ogawa, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Sept. 17, 1975, Ser. No. 614,161

Claims priority, application Japan, Oct. 28, 1974, 49-124749

Int. Cl.² H01R *39/00*

U.S. Cl. 339—8 R **8 Claims**

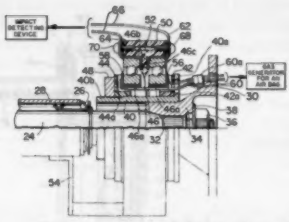
1. An electrical contacting device for providing continuous electrical connection between a first electrical device mounted on a rotatable shaft and a second electrical device mounted on a relatively stationary member, comprising:

a cylindrical base member coaxially and securely mounted on said rotatable shaft, said base member being formed with at one end thereof a flange portion outwardly extending therefrom and at the other end thereof a threaded portion;

a pair of annular inner holders concentrically mounted around said cylindrical base member and positioned to be spaced from each other, said annular inner holders being respectively formed with step portions facing each other;

at least one inner race member concentrically mounted on said step portions, said inner race member being connected with said first electrical device;

a lock ring engageable with said threaded portion of said cylindrical base member for locking said inner race member and said pair of annular inner holders against said flange portion of said cylindrical base member;



at least one outer race member concentrically positioned around and radially spaced apart from said inner race member for forming a substantially cylindrical gap between said inner and outer race members, said outer race member being securely connected to said relatively stationary member through outer race members securing means and electrically connected to said second electrical device; and

a plurality of rolling elements located in said cylindrical gap for providing electrical connection between said inner and outer race members.

4,006,955

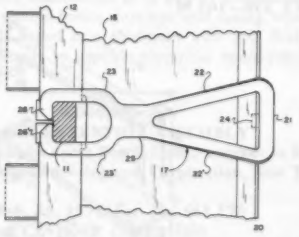
CARD RETAINER

Melvin L. Johnson, Lombard, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Dec. 22, 1975, Ser. No. 642,967

Int. Cl.² H01R *13/54*

U.S. Cl. 339—91 R **1 Claim**



1. A retainer for locking a printed circuit card into its associated connector in a file wherein said file includes cross-bars onto which are mounted said connectors, comprising: an elongated planar ring having a tongue extending inwardly from the periphery of said ring, the tongue and associated portion of said ring being flexible enough to be displaced for hooking over the edge of a printed circuit card in said file, and a pair of hooked tines at the opposite end of said ring projecting outwardly, the hook portions of said tines facing each other, said tines being flexible enough to permit the hooked portions to be displaced out of the plane of said ring for passage of said hooked portions past said cross-bar and to return to their original position to hook around said cross-bar, to thereby lock said printed circuit card in its associated connector.

4,006,956

STRAIN RELIEF DEVICE

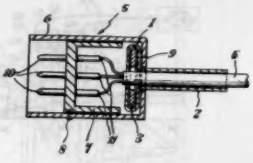
Werner Allgaier, Sauerlach, Germany, assignor to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 371,676, June 20, 1973, abandoned. This application July 14, 1975, Ser. No. 595,785

Claims priority, application United Kingdom, June 22, 1972, 29275/72

Int. Cl.² H01R *13/58*

U.S. Cl. 339—103 M **14 Claims**



9. A strain relief device comprising:

a plug member having a rear wall with a first aperture formed therein;

a heat shrinkable sleeve having a first and second portion, said first portion being in a recovered state and said second portion being in an expanded state and forming a pathway capable of receiving an electrical cable, said second portion of said heat shrinkable sleeve positioned in said first aperture of said plug, and

a disk having a diameter larger than said first aperture and having annular faces defining one centrally located second aperture, said first portion of said sleeve being recovered onto said faces, said second aperture being in alignment with said pathway thereby forming a further part of the pathway capable of receiving an electrical cable.

4,006,957

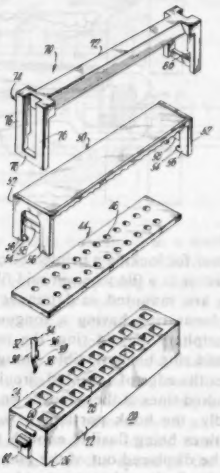
CONNECTOR

Ronald S. Narozny, Panorama City, Calif., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Continuation of Ser. No. 509,236, Sept. 25, 1974, abandoned. This application Feb. 23, 1976, Ser. No. 660,537

Int. Cl.² H01R *13/58*

U.S. Cl. 339—103 M **7 Claims**



1. A connector for connecting each of the conductors of a multi-conductor flat cable to a termination point comprising: a base member having a first surface and a second surface and a plurality of apertures therein extending from said first surface to said second surface, the number of said apertures being equal to the maximum number of conductors which can be present in said multi-conductor flat cable; a plurality of elongate contacts, one for each of said apertures, said contacts having a circular, dual slotted conductor contact portion, said two slots dividing said contact into two radial arms, at one end of said contact, a post contact portion at its other end and a tab, having a first edge and a second edge, intermediate the two ends of said contact, said contacts being inserted in said apertures to position said conductor contact portion adjacent said first surface of said base member with the first edge of said tab aligned with said first surface of said base member and said post contact portion adjacent said second surface of said base member; keeper means having a plurality of additional apertures equal in number to the number of apertures in said base member and of a size which permits said arms to freely deflect in a first direction radially outwardly from the longitudinal axis of said contact as a conductor of such multiconductor flat cable is forced into said two slots of said conductor contact portions; said keeper means having a predetermined thickness less than the height of said conductor contact portions to permit said arms to freely deflect in a second direction obliquely away from the longitudinal axis of said contact, said keeper means being permanently coupled to said base member in such manner as to align said additional apertures with said apertures in said base member; cover means having an inner surface and an outer surface, and a plurality of recesses in said cover means extending from said inner surface towards said outer surface and terminating intermediate said inner and outer surface, one recess for each of said contacts and aligned with said additional apertures of said keeper means, each recess arranged to receive the free ends of said arms of its associated contact after said arms have pierced the insulation and extended through the thickness of such multi-conductor flat cable; and latch means for selectively coupling said base member to said cover means; the application of a force to said outer surface of said cover means, when a multi-conductor flat cable is inserted between said inner surface of said cover means and the free ends of said arms of said contacts, causing each conductor of said multiconductor flat cable to enter its associated one of said contacts and the free ends of said arms to enter its associated recesses in said cover means as said latch means operates to hold said inner surface of said cover means and the exposed surface of said keeper means in intimate contact with said multi-conductor flat cable.

4,006,958

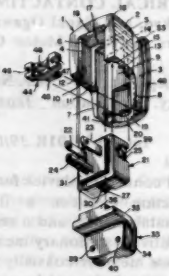
RIGHT ANGLE ELECTRICAL PLUG

David E. Kramer, and Russell F. Stoll, both of Northbrook, Ill., assignors to Daniel Woodhead, Inc., Northbrook, Ill.

Filed Feb. 21, 1975, Ser. No. 551,785

Int. Cl.² H01R *13/58*

U.S. Cl. 339—110 P **10 Claims**



1. A right angle electrical plug comprising:

a. a housing having first and second leg portions forming a

generally right angle configuration,

b. a first insert member having electrical contact blades thereon adapted to have electrical conductors connected thereto and removably received within that portion of the housing forming the first leg portion thereof so that said blades thereon extend outwardly therefrom to be inserted into an electrical receptacle,

c. a second insert member removably received in that portion of the housing forming the second leg portion thereof,

d. cooperating interengaging parts on said first and second insert members so arranged that said first insert member cannot be removed while said second insert member is in place, said first insert member being otherwise readily removable,

e. means to secure said second insert member in said housing to prevent removal of both of said inserts, and

f. an opening between the second leg portion of said housing and said second insert member for receiving a cable having electrical conductors therein for connection with said contact blades.

4,006,959

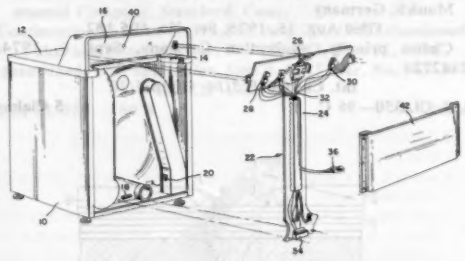
INTRINSIC CERTIFICATION ASSEMBLY TECHNIQUE FOR WIRING COMPONENTS INTO AN ELECTRICAL APPARATUS

John Root Hopkins, Belleair, Fla.; Robert Maurice Renn, and Robert Keith Southard, both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 520,399, Nov. 4, 1974, Pat. No. 3,970,354. This application Jan. 14, 1976, Ser. No. 649,009

Int. Cl.² H01R *3/00*

U.S. Cl. 339—113 R **9 Claims**



1. A system for wiring electrically powered or controlled apparatus such as appliances, computers, copy mahines, vehicles and craft, and the like, comprising:

a frame adapted to be mounted proximate said apparatus in a single position;

mounting means on said frame adapted to receive a plurality of components and connectors each in a single position only, said mounting means on said frame preventing assembly of the respective connectors, components and their respective subassemblies on said frame unless said connectors and components are fully mated; and

conductor securing means on said frame for holding in place conductors interconnecting said connectors.

4,006,960

MEMBER FOR CONNECTING THE END OF A CONDUCTOR TO A PIN

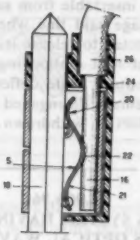
Guy Lacan, Carrieres sous Bois, France, assignor to La Telemecanique Electrique, France

Filed May 6, 1975, Ser. No. 575,116

Claims priority, application France, May 15, 1974, 74.16811

Int. Cl.² H01R *9/12*

U.S. Cl. 339—274 **6 Claims**



1. An electrical connecting member, for connecting an end portion of a first conductor electrically with a second conductor, comprising:

i. a sleeve of insulating material, said sleeve having an opening to receive said first conductor;

ii. an elongated casing disposed in said sleeve and having a first open end adjacent the sleeve opening and a second opposed open end;

iii. an elongated tongue within the casing mounted thereto only at one extremity adjacent one open end and extending towards the other open end, said tongue being free at its other extremity and defining in said casing a first recess at one side of the tongue to receive said first conductor, said tongue defining in said casing a second parallel recess at the other side of said tongue to receive said second conductor parallel to said first conductor, said tongue being of normally undulant shape along its length so as to occupy a space greater than the spacing between said first and second conductors when they are disposed respectively in said first and second recesses, said tongue being resiliently deformable in to permit introduction of said first and second conductors into said casing, whereby said tongue is urged into abutment with said first and second conductors to provide electrical connection between them.

4,006,961

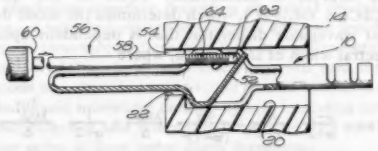
CONTACT RETENTION ASSEMBLY

Jack E. Langenbach, Newport Beach, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Feb. 25, 1976, Ser. No. 661,179

Int. Cl.² H01R *13/42, 43/00*

U.S. Cl. 339—217 S **3 Claims**



1. An electrical connector and extraction tool combination comprising:

an insulator having a front face and a rear face with a contact cavity therein extending from said front face to said rear face;

an electrical contact mounted in said cavity, said contact comprising an electrically conductive body having a forward contacting section and a retention section behind said contacting section;

a spring retention tine on said retention section extending rearwardly at an angle across said cavity to frictionally engage the wall of said cavity, the section of said cavity between said tine and said rear face having a uniform cross-section;

means on said retention section providing a relatively stationary tool-receiving aperture in front of said tine; and

an extraction tool insertable from said front face into said aperture to engage said tine whereby said tine will be rearwardly deflected to release its engagement with said cavity wall, said tool embodying means for positively gripping said contact while deflecting said tine so that said tine will remain disengaged from said cavity wall when said contact is withdrawn rearwardly from said cavity.

4,006,962

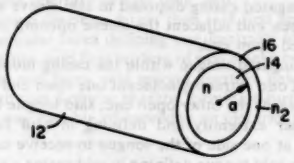
COMMUNICATION SYSTEM HAVING LOW DISPERSION GLASS OPTICAL WAVEGUIDE

Robert Olshansky, Addison, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed May 27, 1975, Ser. No. 581,281

Int. Cl.² G02B 5/14

U.S. Cl. 350—96 WG **4 Claims**



1. An optical communication system comprising

a light source having a mean wavelength λ_0,

a cylindrical, multimode, optical waveguide having input and output ends, said input end being disposed in light receiving relationship with respect to said source, said waveguide having a core of radius a surrounded by a layer of cladding material having a refractive index n_2, the on-axis refractive index n_1 of said core being greater than n_2, and the index distribution in said core as a function of the radius r being defined by the equation

$$n(r) = n_1[1-2\Delta(r/a)^\alpha]^{1/2} \text{ for } r < a$$

where $\Delta = (n_1-n_2)/n_1$ and α is a parameter between 1 and infinity, but not equal to about 2,

means for causing mode coupling in said waveguide, said mode coupling means, said mean source wavelength and said optical waveguide being such that the quantity $\lambda_0^2 n_1''$, which determines the mode independent material dispersion that is dependent upon the spectral width of said source, is substantially equal to the quantity $2n_1\Delta C(\alpha)M_{11}(\alpha)$, which determines the mode dependent waveguide dispersion that is dependent upon the spectral width of said source, where

$$C(a) = \frac{\alpha-2}{\alpha+2}\,\frac{\alpha}{\alpha+2} + \frac{4\alpha}{(\alpha+2)^2}\,\frac{\lambda 0\Delta'}{\Delta} + \frac{1}{\alpha+2}\,\frac{\lambda 0\Delta''}{\Delta}^2$$

and wherein the matrix element M_{11} is a number between 0.1 and 1.0, depending upon the index gradient α and the nature of the perturbation caused by said mode coupling means, and

means for detecting light radiating from the output end of said waveguide.

4,006,963

CONTROLLABLE, ELECTRO-OPTICAL GRATING COUPLER

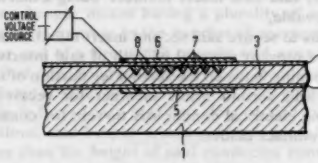
Peter Baues, Krailling; Hans Mahlein, Munich; Achim Reichelt, Munich, and Gerhard Winzer, Munich, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed July 21, 1975, Ser. No. 597,663

Claims priority, application Germany, Sept. 6, 1974, 2442723

Int. Cl.² G02B 5/14, 5/18

U.S. Cl. 350—96 C **8 Claims**



1. A controllable, electro-optical grating coupler for optional switch-over or modulation of optical waves in waveguides, comprising:

a substrate;

a first areal electrode carried on said substrate;

a first dielectric layer carried on said first areal electrode;

a waveguide carried on said first dielectric layer for the propagation of light in a predetermined direction, including a periodic grating structure transversely of the direction of propagation, said wave-guide including electro-optical material in the region of the grid structure;

a second dielectric layer carried on said waveguide; and

a second areal electrode arranged on said second dielectric layer.

4,006,964

INTEGRATED OPTICAL WAVEGUIDE HAVING A FILTER

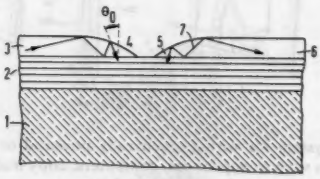
Hans Mahlein, and Gerhard Winzer, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Aug. 15, 1975, Ser. No. 605,182

Claims priority, application Germany, Sept. 6, 1974, 2442724

Int. Cl.² G02b 5/14; G02B 5/30

U.S. Cl. 350—96 C **5 Claims**



1. An integrated optical waveguide with a filter, characterized in that a multilayer filter system having alternating high-refractive and low-refractive layers applied onto a substrate has arranged upon a first layer thereof opposite the substrate first and second waveguide portions having closely spaced, adjacent tapered ends,

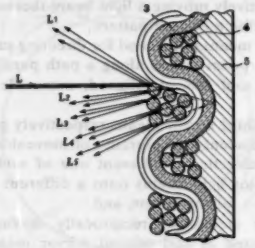
the effective indices of refraction for light in the two waveguides being greater than the index of refraction of said first layer of the filter.

4,006,965

PROJECTION SCREEN

Ryosaku Takada, 5-54, 4 -chome, Ayazono, Takaishi, Osaka, and Akemi Joma, 25-21, 3-chome, Shindo, Ibaraki, Osaka, both of Japan

Filed Dec. 23, 1974, Ser. No. 535,306
Claims priority, application Japan, Apr. 18, 1974, 49-44540[U]; May 8, 1974, 49-51532
Int. Cl.² G03B 21/60
U.S. Cl. 350—117 4 Claims



1. A screen comprising a woven transparent fabric layer made of clear glass yarn with a transparency more than 90 percent and having a front exposed surface of uniformly and minutely rough textile weave, and a layer of highly reflecting aluminum joined to said transparent fabric layer at a rear surface thereof, said transparent fabric layer having an optically dense structure for providing a highly diffused reflection of light beam projected thereto in combination with said layer of highly reflecting aluminum.

4,006,966

PROCESS FOR PREPARATION OF AN ELECTRODE STRUCTURE CONTAINING WO_3 USE OF THE STRUCTURE IN AN ELECTROCHROMIC CELL

Marion Douglas Meyers, Stamford, Conn., and Henry Patrick Landi, Yorktown Heights, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 392,165, Aug. 27, 1973, abandoned, which is a division of Ser. No. 105,882, Jan. 12, 1971, abandoned. This application Apr. 4, 1975, Ser. No. 565,307
Int. Cl.² G02F 1/36
U.S. Cl. 350—160 R 6 Claims

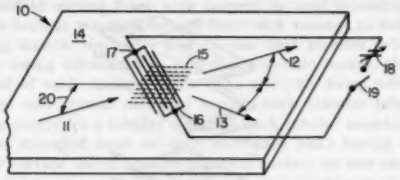
1. In a variable light modulating device comprising a layer of persistent electrochromic material as a light modulating material, a counter-electrode, an electrolyte material in contact with said light modulating material and said counter-electrode, the improvement being a counter-electrode comprising a sheet of an admixture of a persistent electrochromic material, a fibrillated plastic binder and an electrically conductive material pressed onto a planar electrically conductive support.

4,006,967

DIRECTING OPTICAL BEAM

Richard P. Kenan; Carl M. Verber, both of Columbus, and Van E. Wood, Delaware, all of Ohio, assignors to Battelle Memorial Institute, Columbus, Ohio

Filed Apr. 23, 1975, Ser. No. 570,836
Int. Cl.² G02F 1/16
U.S. Cl. 350—160 R 23 Claims



1. A method of directing a beam of optical radiation toward a selected location, and modulating the intensity thereof at the location, comprising

directing the beam over a path that includes a Bragg grating, and

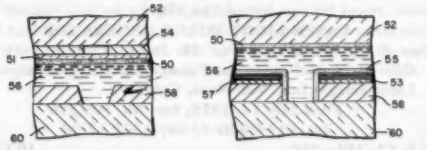
selectively modifying the angle between the direction at which the beam enters the Bragg grating and a direction of Bragg incidence of the grating.

4,006,968

LIQUID CRYSTAL DOT COLOR DISPLAY

Michael N. Ernstoff, Los Angeles; William C. Hoffman, Torrance, and Richard N. Winner, Palos Verdes Peninsula, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed May 2, 1975, Ser. No. 574,150
Int. Cl.² G02F 1/13
U.S. Cl. 350—160 LC 5 Claims



1. A display system comprising in combination:

a first electrode structure formed on one surface of a flat bulk silicon substrate wafer;

a thin transparent plate, one side of which covers said first electrode structure;

a second electrode structure formed on said one side of the thin transparent plate;

a plurality of color selective interference filters deposited on another side of said thin transparent plate forming columnar strips selective of different adjacent colors;

an insulating structure providing electrical insulation between said first electrode structure and said second electrode structure and creating interstices therebetween;

liquid crystal material positioned between said first electrode structure and said second electrode structure so as to fill said interstices created by said insulating structure;

arrangement of said interstices positioned with said columnar strips to form color triads therefrom;

a transparent cover plate positioned to protect said display system and retain said liquid crystal material between the first and second electrode structures; and

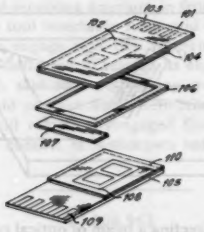
means coupled to said first and second electrode structures for applying electric current thereto, thereby creating electric fields in selected ones of said interstices.

4,006,969

ELECTRO-CHROMIC DISPLAY DEVICE

Akihiko Kouchi; Kunihiro Inoue; Hiroshi Takeshita; Kuniharu Yamada, and Tsutomu Otake, all of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Japan

Filed Dec. 8, 1975, Ser. No. 638,579
Claims priority, application Japan, Dec. 9, 1974, 49-141360
Int. Cl.² G02F 1/23
U.S. Cl. 350—160 R **10 Claims**



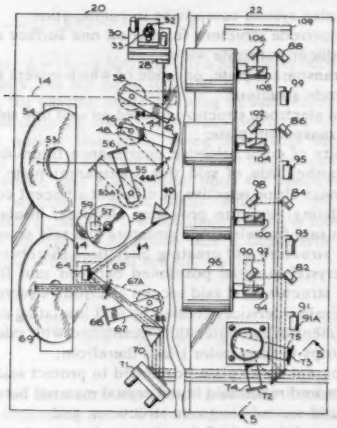
1. An electro-chromic display device, comprising first and second opposed plates, at least said first plate being transparent, electrodes in the form of indicia on the inner surface of each of said opposed plate, the electrode on at least said first plate being transparent, a transparent electrolyte disposed between said plates, a common electrode, an electro-chromic material making contact with said indicia on each of said plates and said common electrode, said common electrode and said indicia on each plate being selectively connectable to an external source of voltage in a selected polarization direction, said common electrode and said indicia forming electrodes being so positioned in non-registry with each other for selectively actuating the indicia on either plate for display so that two sets of indicia may be available in the space normally available for only one set.

4,006,970

LASER LIGHT IMAGE GENERATOR

Dan Slater, Fullerton; Ivan M. Dryer, Canoga Park, and Charles W. McDanald, La Canada, all of Calif., assignors to Laser Images Inc., Van Nuys, Calif.

Filed July 14, 1975, Ser. No. 595,516
Int. Cl.² G05D 25/00; A63J 17/00
U.S. Cl. 350—285 **10 Claims**



1. A system for generating light images of various colors comprising

laser means for generating a single light beam capable of being separated into a plurality of different color light beams,

first prism means for producing as an output a plurality of different color light beams from said single light beam,

first mirror means for directing said single light beam on said first prism means,

second prism means for collimating the output of said first prism means to produce as output a plurality of different color light beams having spaced parallel paths,

a plurality of spaced aligned moveably *x-y* mirror means each respectively moving a light beam thereon in a manner to describe a desired pattern,

second mirror means positioned for directing said output of said second prism means along a path parallel to a line defined by said spaced, aligned, moveable *x-y* mirror means,

a plurality of third mirror means respectively positioned in said path adjacent said plurality of moveable *x-y* mirror means for directing a different one of said collimated different color light beams onto a different one of said moveable *x-y* mirror means, and

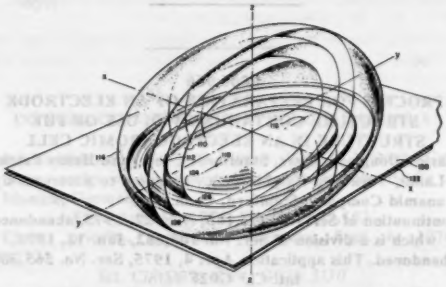
beam torquer means for reciprocally moving the light beams directed at said second mirror means whereby each of the patterns described by said moveable *x-y* mirror means is made to change color.

4,006,971

REFLECTIVE IMAGING APPARATUS

William T. Plummer, Concord, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation of Ser. No. 333,188, Feb. 16, 1973, abandoned, which is a division of Ser. No. 141,253, May 7, 1971, Pat. No. 3,735,685. This application Jan. 28, 1975, Ser. No. 544,713
Int. Cl.² G02B 5/10, 3/08
U.S. Cl. 350—293 **19 Claims**



8. Generally planar reflecting means, comprising:

a first face;

a second face disposed in back-to-back relation with said first face; and

a plurality of echelon arranged surfaces disposed along said first face, each having a cross-sectional pitch relative to said first face that varies over a path along the surface and equidistant from said first face.

4,006,972

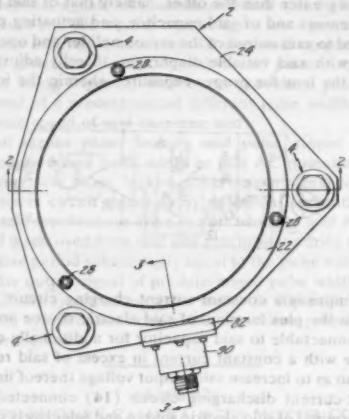
LASER MIRROR COOLANT PRESSURE BALANCE MEANS

Russell L. Nachtman, North Palm Beach, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed May 12, 1975, Ser. No. 576,492
Int. Cl.³ G02B 5/08
U.S. Cl. 350—310 **7 Claims**

1. In combination, a mirror, means for mounting said mirror, said mirror containing coolant passages, said mirror having a cylindrical hole therein extending inwardly from an

opening in the side of the mirror, said cylindrical hole having a bottom surface, opposite said opening first passage means connecting said cylindrical hole to said coolant passages, said first passage means entering said cylindrical hole at a location between its opening and bottom surface, a first cylindrical section of said cylindrical hole being located between said location and said bottom surface, a second cylindrical section



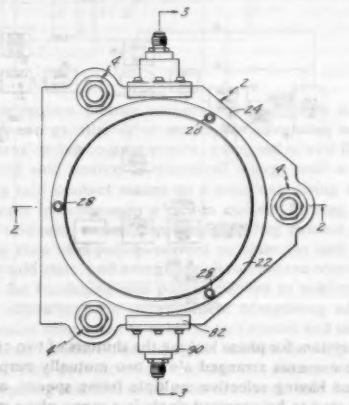
of said cylindrical hole being located between said location and said opening, a first piston in the first cylindrical section, means connecting said first piston to said mounting means for preventing said piston from engaging said bottom surface, tubular means extending into said second cylindrical section, said tubular means providing a passageway between the exterior of said mirror and said first passage means for directing a coolant therebetween.

4,006,973

LASER MIRROR COOLANT PRESSURE BALANCE MEANS WITH SEPARATE INLET AND OUTLET MANIFOLDS

Arthur L. Zanotti, and Robert K. Stalcup, both of Lake Park, Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 12, 1975, Ser. No. 576,493
Int. Cl.² G02B 5/08
U.S. Cl. 350—310 **1 Claim**



1. In combination, a mirror, means for mounting said mirror, said mirror containing coolant passages, said mirror having a first opening therein and a second opening therein, said first opening being connected to one end of said coolant passages and said second opening being connected to the other end of said coolant passages, first means for directing a coolant fluid to said coolant passages including a first transfer tube assembly, second means for directing a coolant fluid from said coolant passages including a second transfer tube assembly, said first transfer tube assembly having one end positioned in said first opening, said second transfer tube assembly having one end positioned in said second opening, a first manifold means fixed with respect to said mounting means, a second manifold means fixed with respect to said mounting means, the other end of said first transfer tube assembly being connected to said first manifold means, the other end of said second transfer tube assembly being connected to said second manifold means, each transfer tube assembly comprises a tubular member, each tubular member having an enlarged head on each end, each head having a spherical surface thereon, each spherical surface on one end extending into its cooperating opening in said mirror, the spherical surface on the other end of each tubular member being connected to its manifold means to limit its movements into its cooperating opening, each enlarged head being connected to its manifold means by being confined between an inner seat and an outer stop means in its manifold means, the end of each tubular member connected to its manifold means having a seat in the end thereof, a rod member positioned in each tubular member, each rod member having a cylindrical member fixed on one end contacting its cooperating opening in said mirror and a cap member fixed on the other end, each cap member having a spherical surface for engaging its seat in the end of its tubular member for limiting the movement of its cylindrical member so that it does not contact the bottom of its cooperating opening, each cap member being retained between the end of its tubular member and its outer stop means, each cap member having opening means therethrough for the flow of a coolant, said first manifold means includes a first outer member fixed to said mounting means aligned with said first opening, said second manifold means includes a second outer member fixed to said mounting means aligned with said second opening, each outer member having an insert fixed therein and an adapter connected to said insert, each insert having an inner seat, each adapter forming an outer stop means for its cap member, each adapter having an opening therein to provide a passage connected to the cap member.

4,006,974

EYEGLASS STRUCTURE

Sam L. Resnick, 15-43 200th St., Bayside, N.Y. 11360

Filed Sept. 26, 1975, Ser. No. 617,047
Int. Cl.² G02C 9/02
U.S. Cl. 351—59 **10 Claims**

1. A spectacle apparatus adapted to be supported and worn by a user comprising first and second lens assemblies, a bar located between said lens assemblies and having a back surface including an adhesive for direct coupling of the bar to the forehead area of a user, said bar as located causing said lens assemblies to be positioned each in front of a respective eye of the user.

4,006,975

FADE-OVER APPARATUS FOR A MOTION PICTURE CAMERA

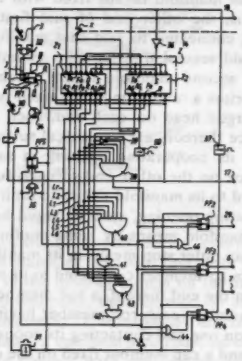
Eduard Wagensonner, Aschheim, and Alfred Winkler, Munich, both of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed July 23, 1975, Ser. No. 598,386

Claims priority, application Germany, July 26, 1974, 2436019

Int. Cl.² G03B 21/36

U.S. Cl. 352—91 C 12 Claims



1. In a motion picture camera having film including a plurality of frames, film transport means for transporting said film along a predetermined path, an aperture and aperture control means including a light-sensitive element and adjustment means for adjusting the size of said aperture to a normal or a fade-out size in response to a first or second control signal respectively, a fader arrangement, comprising, in combination, externally operable start signal furnishing means for furnishing a start signal initiating a fade-out; counting means connected to said start signal furnishing means for counting the number of frames transported along said predetermined path following receipt of said start signal and furnishing counting signals corresponding to the number of so-counted frames; first circuit means connected between said counting means and said aperture control means for furnishing said second control signal to said adjustment means in response to a first predetermined one of said counting signals, thereby initiating said fade-out; and second circuit means connected between said counting means and said film transport means for furnishing a stop signal stopping said film transport means in response to a second predetermined one of said counting signals following said first predetermined one of said counting signals by a predetermined time interval at least sufficient for completion of said fade-out.

4,006,976

FADE-IN AND FADE-OUT DEVICE OF A CINECAMERA

Yasuo Ishiguro, Tokyo, Japan, assignor to Copal Company Limited, Tokyo, Japan

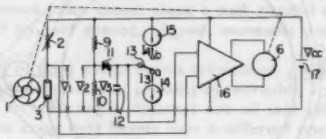
Filed July 16, 1975, Ser. No. 596,415

Claims priority, application Japan, July 19, 1974, 49-82265; July 19, 1974, 49-82266; July 19, 1974, 49-82267

Int. Cl.² G03B 21/36

U.S. Cl. 352—91 C 9 Claims

1. An improved fade-in and fade-out device of a cinecamera having an automatic exposure control circuit including an electric source (17), a photoelectric element (3) having an output and being arranged behind one of two variable diaphragms (1, 100), namely that of a lens of the cinecamera and that coupled with a diaphragm of the lense, for receiving light from a scene therethrough so as to generate an output voltage indicative of scene brightness, a reference-voltage circuit having a capacitor (12) charged by said electric source so that the output voltage thereof is used as the reference voltage, a servo-amplifier (16) connected with its inputs to said output of the photoelectric element and the output of said capacitor, respectively, so as to continue to generate an output until the output voltages of said photoelectric element and said capacitor are made equal, the polarity of said output of the servo-amplifier being determined depending upon which of said outputs is greater than the other, namely that of said photoelectric element and of said capacitor, and actuating means 6 connected to said output of the servoamplifier and operatively coupled with said variable diaphragm, thereby adjusting the latter of the lens for proper exposure, wherein the improvement comprises a constant-current charging circuit 15 connected to the plus terminal of said electric source and selectively connectable to said capacitor for additionally charging the same with a constant current in excess of said reference voltage so as to increase said output voltage thereof linearly, a constant-current discharging circuit (14) connected to the minus terminal of said electric source and selectively connectable to said capacitor for discharging the same with a constant current so as to decrease said output voltage thereof linearly to said reference voltage, and switching means (13) for alternately connecting said capacitor to one of said charging circuit and said discharging circuit, thereby permitting the fade-in and the fade-out to be effected by said variable diaphragm of the lens.



4,006,977

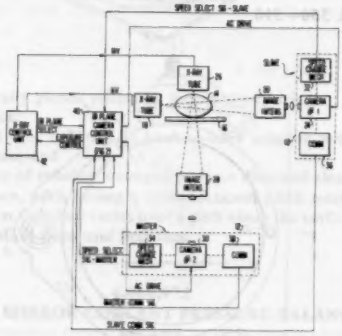
PHASE CONTROL SYSTEM FOR POLARIZED SYNCHRONOUS MOTORS

Charles Lawrence Harrow, Baltimore; Jean Claude Bonnace, Kensington, and Gunter Gerd Wilkens, Baltimore, all of Md., assignors to CGR Medical Corporation, Baltimore, Md.

Filed Jan. 22, 1976, Ser. No. 651,258

Int. Cl.² G03B 19/18

U.S. Cl. 352—133 14 Claims



1. A system for phase locking the shutters of two cinefluorographic cameras arranged along two mutually perpendicular axes and having selective multiple frame speeds, and which are adapted to be operated singly in a mono-plane mode or in combination in a biplane mode, alternately or simultaneously, said cameras being driven by respective synchronous drive motors, the improvement comprising in combination:

respective circuit means applying an AC potential of a predetermined frequency to each of said synchronous drive motors;

means coupled to said shutters providing respective electrical output signals in response to the open and closed state of said shutters;

circuit means coupled to said respective electrical output signals and being operative to compare the phase of said electrical signals for a common frame speed of said cameras to provide a pulse output signal for a predetermined phase difference between said electrical output signals;

signal generator means coupled to said pulse output signal and being triggered thereby to provide a pulse output signal of a predetermined different pulse width for each frame speed of said cameras; and

circuit means phase locking said pulse output signal of predetermined pulse width to said AC potential and applying said phase locked pulse output signal to said respective circuit means applying said AC potential to one of said synchronous drive motors whereby said AC potential is removed from said one synchronous drive motor for a time period substantially equal to the pulse width of said pulse output signal of predetermined pulse width causing said one synchronous drive motor to slip relative to the other synchronous drive motor to achieve proper phasing therebetween.

4,006,978

MOTION PICTURE CAMERA WITH MOTOR CONTROL CIRCUIT HAVING DECREASED POWER CONSUMPTION

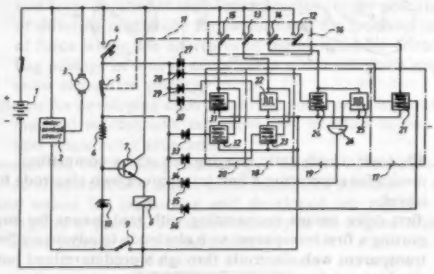
Franz Bien; Karel Pustka, both of Munich, and Eduard Wagensonner, Aschheim, all of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed Aug. 22, 1975, Ser. No. 607,055

Claims priority, application Germany, Aug. 30, 1974, 2441544

Int. Cl.² G03B 1/00

U.S. Cl. 352—174 **10 Claims**



1. In a motion picture camera having film, a source of electrical energy, film drive means for advancing said film, relay means having contact means connected to said film drive means and said source of electrical energy and a coil for operating said contact means to a state energizing said film drive means in reponse to a pull-in current flowing through said coil said relay means requiring a holding current substantially less than said pull-in current to maintain said contact means in said state, and energizing circuit means connected to said coil for furnishing said pull-in current to said coil upon external activation, the improvement comprising additional circuit means connected to said contact means and said energizing circuit means, for reducing the current through said coil to said holding current when said contact means are in said state energizing said film drive means, wherein said energizing circuit means comprise connecting means for connecting said energizing circuit means to said source of electrical energy upon external activation, and variable impedance means having a controlled impedance circuit connected in series with said coil and a controlling circuit connected to said connecting means, said contact means and said additional circuit means, for controlling the current through said coil to said pull-in current prior to said operating of said contact means and to said holding current following said operating of said contact means, wherein said contact means comprise a single pair of contact connected to said film drive means, and said additional circuit means, wherein said variable impedance means comprises a transistor having an emitter connected to said coil and a base connected to said connecting means; and wherein said additional circuit means comprises a Zener diode connected between said base and said pair of contacts, where said camera further comprises at least one special effect circuit and at least one selector switch for connecting said special effects circuit to said source of electrical energy upon external activation; wherein said connecting means comprise a normally open switch connected to said source of electrical energy; further comprising a normally closed switch having a first contact connected to said normally open switch and a second contact connected to said base of said transistor, means for connecting said special effects circuit in parallel with said normally closed switch, and coupling means for coupling said normally closed switch to said selector switch in such a manner that said normally closed switch opens when said selector switch closes.

4,006,979

ELECTROMAGNETIC RELEASE DEVICE FOR A MOTION PICTURE CAMERA

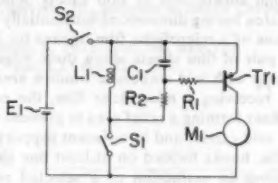
Teiji Hashimoto, Kawasaki; Tomoshi Takigawa, Machida, and Toshikazu Ichiyanagi, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 10, 1974, Ser. No. 432,247

Claims priority, application Japan, Jan. 17, 1973, 48-7670

Int. Cl.² G03B 1/00

U.S. Cl. 352—176 **12 Claims**



1. A release arrangement for a photographic camera operably by means of an electric current source, comprising:

a motor for operating said camera;

a shutter means operated by the driving force of the motor;

a release means blocking the operation of said shutter means, and including:

1. blocking means, a part of which is capable of selectively shifting into and out of a movable region of said shutter means; and

2. an electromagnet means for controlling and shifting of said blocking means; and

delay means for delaying the timing of current flow through said motor for a predetermined time relative to the timing of the operation of the electromagnetic means, said delay means comprising:

1. an electronic switching circuit for controlling the starting and stopping of said motor, said circuit having a transistor circuit including an output circuit arranged for connecting and disconnecting said motor to said electric current source; and

2. an RC time constant circuit electrically connected to an input circuit of said transistor circuit, said time constant circuit being so arranged as to electrically charge electric current in a predetermined time immediately after cur-

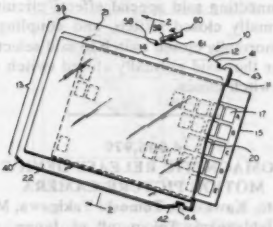
rent from said source is imparted to said electromagnet means, to cause said transistor output circuit to connect said motor to said source when the electric charging is completed, to discharge said charged current likewise in a predetermined time, immediately after the provision of the current from said source to said electromagnet means is interrupted, and to cause said transistor output circuit to disconnect said motor from said source after completion of the electric discharge.

4,006,980

MICROFICHE CARRIER

Thomas R. Wells, Des Plaines, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Dec. 16, 1974, Ser. No. 532,798
Int. Cl.² G03B *23/00*
U.S. Cl. 353—118 **4 Claims**



1. A microfiche film carrier for use in a library file which supports a plurality of microfiche carriers in a spaced parallel side-by-side relationship, with a latch for normally securing the carriers in the file, said carrier comprising: a pair of transparent film sheets, one of said sheets being embossed in a window area having dimensions substantially corresponding to dimensions of a microfiche film, means for adhesively securing said pair of film sheets along three edges in face-to-face relationship with said embossed window area forming a relief area for receiving a microfiche film, the edges of said embossed sheet forming a relief area to prevent thickness binding between said carrier and its adjacent supporting structure in a library file, hooks formed on at least one side of said carrier for enabling an extraction of a selected microfiche carrier from a library file, and a latch receiving keeper notch along at least one side of said carrier, whereby a library file latch engages the latch receiving keeper notch to hold the microfiche carrier in a library file.

4,006,981

HALF TONE DEVELOPMENT FOR TOUCHDOWN SYSTEM

Joseph Fantuzzo, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 481,079, June 20, 1974, abandoned, which is a division of Ser. No. 351,221, April 16, 1973, Pat. No. 3,881,927. This application Oct. 2, 1975, Ser. No. 619,101
Int. Cl.² G03G *15/08*
U.S. Cl. 355—3 DD **12 Claims**

3. Apparatus for developing latent electrostatic images carried by a substrate comprising

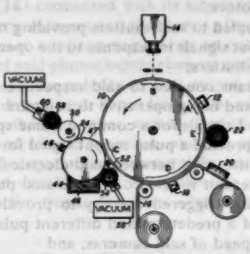
a donor member,

means for loading said donor member with a layer of toner,

charging means for imparting a uniform electrical charge of predetermined polarity to said donor layer,

means for subjecting said charged toner layer to an electrostatic field having an intensity varying in accordance with a grid-like pattern to create a corresponding pattern of hills and valleys in said toner layer, and

means for presenting said patterned toner layer to said



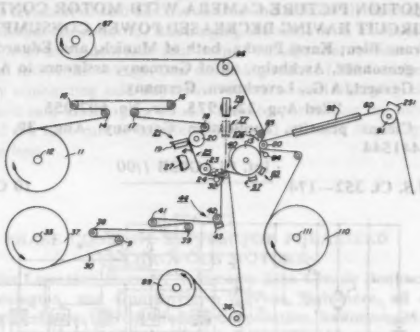
substrate for developing said images, whereby the grey scale content of said images tend to be preserved.

4,006,982

PHOTOELECTROPHORETIC CONCURRENT PROCESS CYCLING

Gino F. Squassoni, Pittsford, and Earl V. Jackson, Penfield, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 24, 1975, Ser. No. 571,326
Int. Cl.² G03G *15/00*
U.S. Cl. 355—3 P **10 Claims**



1. Photoelectrophoretic imaging apparatus comprising:

a. means for supporting a first transparent web electrode for travel;

b. first drive means cooperating with said means for supporting a first transparent web electrode to advance a first transparent web electrode through a predetermined path passing an ink coating means and an imaging station;

c. ink coating means for applying a thin film of photoelectrophoretic ink to the first transparent web electrode;

d. means for supporting a second web electrode for travel;

e. second drive means cooperating with said means for supporting a second web electrode to advance the second web electrode through a predetermined path passing the imaging station;

f. an imaging roller mounted at the imaging station, the second web electrode advanced into contact therewith; and whereat the ink carrying surface of the advancing first transparent web electrode is advanced by (a) and (b) into contact with the advancing second web electrode while it is contacting said imaging roller, thereby forming an ink-web sandwich and an imaging zone nip at said imaging roller, the two webs having ink sandwiched between them, supported at the imaging zone nip by said imaging roller on the second web electrode side of the sandwich without a support member contacting the imaging zone area on the first transparent web electrode side of the sandwich at the imaging zone nip;

g. means for coupling a voltage source to the imaging roller to establish an electric field across the ink-web sandwich at the imaging zone nip;

h. exposure means for projecting an image pattern of activating electromagnetic radiation through the first transparent web electrode onto the ink-web sandwich at said imaging roller;

i. means for separating the two webs from contact after the two webs have been advanced past the imaging station and said imaging roller to form an image pattern corresponding to the activating electromagnetic radiation on at least one of the webs; and

k. cycling means for timing application of a next successive film of photoelectrophoretic ink onto the first transparent web electrode concurrently with completion of image formation in (i) above.

4,006,983

ELECTROSTATIC COLOR PRINTING SYSTEMS USING MODULATED ION STREAMS

Gerald L. Pressman, San Jose, and Kenneth W. Gardiner, Odenthal-Hahnenberg, both of Calif., assignors to Electroprint, Inc., Cupertino, Calif.

Filed Oct. 29, 1973, Ser. No. 410,743
Int. Cl.² G03G *15/01*
U.S. Cl. 355—4 **21 Claims**

1. In a system for electrostatic multicolor printing, the combination of:

means for separating a multicolor original pattern to be reproduced into a plurality of substantially single color separation patterns;

means for generating a stream of ions including an ion source and an ion accelerating electrode spaced from said ion source;

means for producing ion patterns by modulating the ion stream including a multilayer apertured element positioned between the ion source and the accelerating electrode and having at least a conductive layer and an insulative layer capable of supporting bipolar charge potentials of differing magnitude for establishing electrostatic lines of force within the apertures of the element for controlling passage of ions in accordance with each given single color separation pattern;

means for developing each of said ion patterns with marking material substantially corresponding in color to one of said single color separations;

means for neutralizing undeveloped charges subsequent to development of a single color separation pattern;

and means for supporting said developed ion patterns in registry to provide a multicolor copy of the original multicolor pattern to be reproduced.

4,006,984

METHOD AND APPARATUS FOR THE MANUFACTURE OF PRINTING PLATES

Ferdinand Friese, Walldorf, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Nov. 5, 1975, Ser. No. 629,107
Claims priority, application Germany, Nov. 8, 1974, 2452979
Int. Cl.² G03G *15/00, 13/00;* G03B *27/60*
U.S. Cl. 355—11 **24 Claims**

1. An apparatus for the manufacture of printing masters by electrophotographic means comprising:

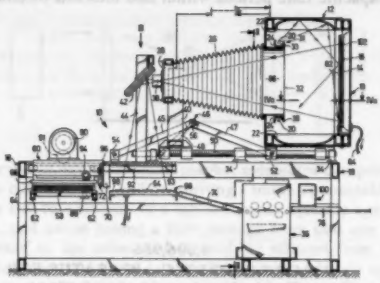
a frame supporting an unexposed printing master holder and carriage means for removal of unexposed printing master from said holder by reduced pressure of a vacuum plate;

an exposure platform communicating with said frame to receive said unexposed printing master from said carriage means and securely retain said printing master during charging and exposure thereof;

charging means communicating with said frame for electrostatic charging of said printing master retained to said exposure platform;

means communicating with said frame for holding an image containing original for illumination and projection onto said printing master;

means communicating with said frame for illumination of



said original by radiation sources capable of only indirect illumination of said original;

means communicating with said illumination means for projection of image of said original onto said charged printing master; and

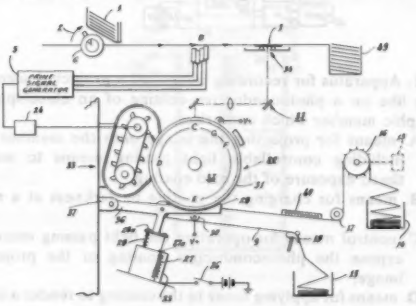
means communicating with said frame for transportation, developing and drying of said printing master after exposure of said printing master to said projected image.

4,006,985

XEROGRAPHIC APPARATUS HAVING TIME CONTROLLED FUSING

Mark A. Hutner, Glenview, Ill., assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 5, 1975, Ser. No. 610,725
Int. Cl.² G03G *15/00*
U.S. Cl. 355—14 **11 Claims**



1. Apparatus comprising:

a. a source generating light images and print signals associated with at least some of the images, any one of the print signals being associated with only one of the images;

b. a support base;

c. toner;

d. means for providing toner images corresponding to light images associated with print signals, on successive sections of the support base;

e. a fuser assembly;

f. means, responsive to said print signals, for turning the fuser on for periods of time related to periodic intervals of time occurring between successive print signals, each of

said periods of time occurring during an interval of time immediately prior to the presentation of a toner image, related to the first of the successive print signals, to the fuser assembly;

g. means for turning the fuser on upon presentation of a toner image to the fuser assembly; and

h. means responsive to the temperature in the fuser for inhibiting means (f) and (g) to turn the fuser off after specific time periods within said intervals of time.

4,006,986

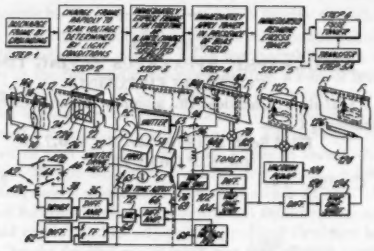
IMAGE RECORDING APPARATUS FOR ELECTROPHOTOGRAPHIC FILM

Manfred R. Kuehnle, Lexington, Mass., assignor to Coulter Information Systems, Inc., Bedford, Mass.

Division of Ser. No. 389,124, Aug. 17, 1973, and a continuation-in-part of Ser. No. 361,951, May 21, 1973, abandoned, which is a division of Ser. No. 260,782, June 8, 1972. This application Jan. 20, 1975, Ser. No. 542,179

Int. Cl.² G03G *15/00*

U.S. Cl. 355—14 **8 Claims**



1. Apparatus for recording images of a projected scene or the like on a photoconductive coating of an electrophotographic member which comprises:

A. means for projecting the image onto the member and including controllable light passing means to enable timed exposure of the said coating,

B. means for charging the coating in darkness at a rapid rate,

C. control means for operating the light passing means to expose the photoconductive coating to the projected image,

D. means for applying toner to the coating to render a latent charge image visible,

E. means for timing variably the periods of charging, exposure and toning, including means coupled thereto for detecting the completion of each of said periods,

F. first and second signal producing means connected with said timing means to produce a first signal when the charging period is completed and a second signal when the exposure period is completed,

G. the signal producing means being coupled to the charging means, control means and toner applying means and the latter three means being responsive to said signals such that the three means are set into operation sequentially, the completion of the charging period starting the exposure period and the completion of the exposure period starting the toning period.

4,006,987

APPARATUS FOR CLEANING A RESIDUAL TONER ON AN ELECTROSTATIC RECORDING MEDIUM

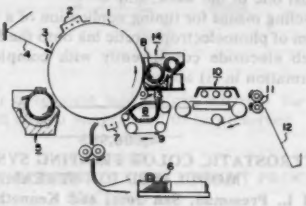
Makoto Tomono; Ken Nakamura, and Koichi Yamakawa, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Nov. 6, 1974, Ser. No. 521,396

Claims priority, application Japan, Nov. 12, 1973, 48-126220

Int. Cl.² G03G *21/00*

U.S. Cl. 355—15 **9 Claims**



1. An apparatus for cleaning residual toner from an electrostatic recording medium comprising;

a. a plurality of magnetic particles,

b. carrier means for carrying said magnetic particles thereon, said carrier means being spaced a selected distance from said electrostatic recording medium, said selected distance being small enough to permit contact of said magnetic particles with said electrostatic recording medium;

c. means for applying a bias potential between said electrostatic recording medium and said carrier means for attracting residual toner particles to said magnetic particles;

d. a toner seizer adjacent to and spaced from said carrier means and spaced from said electrostatic recording medium for removing toner from said magnetic particles, said toner seizer being of insulating material and positioned to be contacted by said magnetic particles carried by said carrier means;

e. a plurality of magnet means within said carrier means, said carrier means and said magnet means being relatively movable with respect to each other, at least one of said magnet means being positioned adjacent said electrostatic recording medium and another of said magnet means being positioned adjacent said toner seizer.

4,006,988

PHOTO-ELECTRIC DEPTH OR TURBIDITY METER FOR FLUID SUSPENSIONS

Per-Henric Sebastian Tamm, Liljeborgsvagen 12, S-752 36 Uppsala, Sweden

Filed Mar. 26, 1975, Ser. No. 562,183

Int. Cl.² G01C *3/08*; G01N *21/26*

U.S. Cl. 356—4 **6 Claims**

1. An apparatus for measuring the level of turbidity in a fluid comprising:

a fluidtight housing for placement in said fluid and having an optical window;

a light source mounted in said housing for producing a beam of light which is directed via said window into said fluid and which diverges about an axis at an angle of between 3 and 10°;

photosensitive means mounted in said housing separated from said light source and having a field of view into said fluid which diverges about an axis at an angle of between 3 and 10° and which intersects said divergent beam of light in said fluid, the area of intersection being symmetrically disposed about an axis extending away from said light source and the angle between the axes of said beam and field being no greater than 25° for measuring the light

in said field scattered or reflected by particles causing said turbidity condition and producing an electrical turbidity signal which varies as a function of the cross-sectional area of said intersection at the level of said particles and, hence, the level of turbidity.

4,006,989

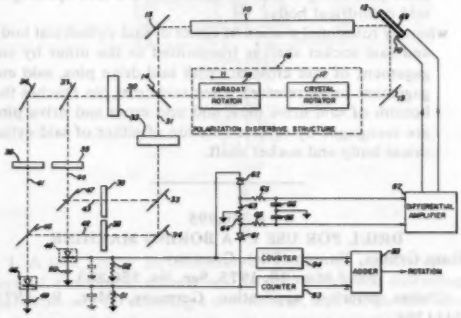
LASER GYROSCOPE

Keimpe Andringa, Sherborn, Mass., assignor to Raytheon Company, Lexington, Mass.

Division of Ser. No. 294,394, Oct. 2, 1972, Pat. No. 3,854,819, which is a continuation-in-part of Ser. No. 120,581, March 3, 1971, Pat. No. 3,741,657. This application Dec. 11, 1974, Ser. No. 531,836

Int. Cl.² G01B 9/02

U.S. Cl. 356—106 LR 10 Claims



1. The method comprising the steps of:

simultaneously directing a plurality of radiant energy waves having at least a plurality of substantially coherent frequencies in opposite directions through a polarization dispersive medium;

amplifying said waves in an amplifying medium which is common to at least a portion of the path of each of said waves;

deflecting said waves at a plurality of points in said path with reflecting filter means; and

varying the frequencies of said waves by moving said mediums and said reflecting filter means as a unit.

4,006,990

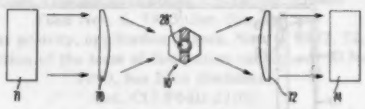
CONVERGENT LIGHT ILLUMINATED FLOW CELL FOR LIQUID CHROMATOGRAPHY

Miner N. Munk, Walnut Creek, Calif., assignor to Varian Associates, Palo Alto, Calif.

Division of Ser. No. 490,548, July 22, 1974, Pat. No. 3,975,104. This application Mar. 22, 1976, Ser. No. 669,136

Int. Cl.² G01N 1/10

U.S. Cl. 356—246 4 Claims



1. For use in liquid chromatography, a detector comprising:

a flow cell, said flow cell comprising a union connectable at one end to a column of a liquid chromatography apparatus, said union having a flow passage from said one end thereof to the other end thereof for effluent from said column, entrance and exit windows disposed in said union on diametrically opposite sides of said effluent flow passage, each of said windows being in the form of a cylinder segment providing a light acceptance angle of at least 45°;

a light source emitting a collimated beam of light rays and having a light emitting area larger than the cross-sectional area of said passage;

a lens for focusing all rays from said light source to said passage through said entrance window in paths normal to the cylindrical surface of said entrance window; and

means for detecting light rays that emerge from said exit window.

4,006,991

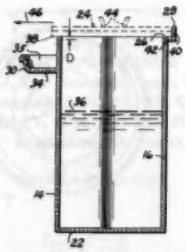
PAINT LOADING APPLICATOR FOR A PAINTING PAD OR BRUSH

Joseph J. Whalen, 1220 SW. 24, Oklahoma City, Okla. 73109

Continuation-in-part of Ser. No. 618,309, Sept. 29, 1975, abandoned. This application Oct. 16, 1975, Ser. No. 622,927

Int. Cl.² A45D 39/16

U.S. Cl. 401—121 2 Claims



1. A rectangular paint containing painting pad paint applicator, comprising:

an upwardly open container having front, back and end walls;

a horizontal ledge secured to the upper limit of said back wall; and,

an upstanding flange secured to the rearward limit of said ledge and forming a back stop adapted for contacting and supporting a longitudinal marginal edge of a painting pad when superposed on said applicator,

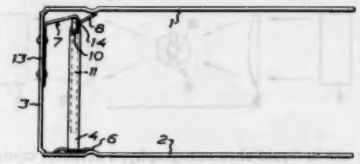
whereby a painting pad, while overlying the open end of said applicator against said stop, is coated with paint in an area equal to the open end area of the applicator when the applicator and painting pad are simultaneously temporarily inverted.

4,006,992

FILE

Sven-Olof Ingemar Persson, Fredmans Grand 6, 644 00 Torshalla, Sweden

Filed Mar. 5, 1976, Ser. No. 664,354
Claims priority, application Sweden, Mar. 7, 1975, 7502566
Int. Cl.² B42F *13/32*
U.S. Cl. 402—47 5 Claims



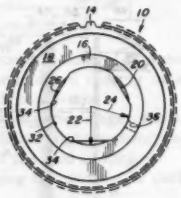
1. A file for holding perforated sheets, which file is provided adjacent its spine with a pair of spaced apart tubular prongs for cooperation with the sheet perforations and at its spine with a leaf spring of which a portion protruding from the inner side of the spine, in the position of use of the file, abuts against the web of a substantially U-shaped wire member, the arms of which engage the tubular prongs to retain the sheets to the tubular prongs, wherein the leaf spring portion protruding from the spine to cooperate with the web of the U-shaped wire member, has a tongue integral with the protruding leaf spring portion and directed towards the spine of the file, which tongue, when the protruding leaf spring portion is caused to abut against the web of the U-shaped wire member, is adapted to snap home under the wire in order to lock the leaf spring to the U-shaped wire member.

4,006,993

SHAFT MOUNTING ARRANGEMENT

Constantijn L. Woerlee, Zwijndrecht, Netherlands, assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Nov. 25, 1975, Ser. No. 635,196
Int. Cl.² F16D *1/06*
U.S. Cl. 403—359 4 Claims



1. A connecting arrangement comprising:

a cylindrical member having a plurality of flat surfaces spaced around at least a portion of its periphery, each flat surface being spaced from an adjacent flat surface by an arcuate surface, the radius of which equals the radius of the cylindrical member, said flat surfaces being chordal surfaces of said cylindrical member;

an annular member having a bore with a plurality of arcuate surfaces of at least two different radii and a plurality of flat surfaces;

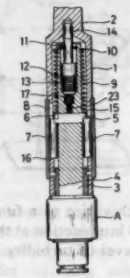
the radius of one group of arcuate surfaces of said annular member being substantially equal to the radius of the arcuate surfaces of said cylindrical member and being in engagement therewith, the flat surfaces of said annular member contacting juxtapositioned flat surfaces of said shaft, and said other arcuate surfaces of said annular member having a smaller radius than that of said one group and each such other arcuate surface being flanked by a flat surface of said bore.

4,006,994

TAP CHUCKING MEANS

Taizo Kato, 3007-104, Obatahigashijima, Moriyamaku, Nagoya, Japan

Filed Apr. 28, 1976, Ser. No. 681,002
Claims priority, application Japan, May 1, 1975, 50-53476
Int. Cl.² B23Q *5/22*
U.S. Cl. 408—142 2 Claims



1. A tap chucking means adapted to mount a tapping chuck comprising:

a cylindrical body having a shank at one end and an opening at the other end;

a socket shaft, having one end adapted to mount the tapping chuck, rotatably and slidably mounted in said cylindrical body and resiliently biased toward the shank end of said body;

a clutch cross pin, secured transversely through said socket shaft, having partially beveled inner faces on both ends of said clutch pin; and,

drive pins diametrically disposed along said socket shaft, said drive pins being axially slidable in axial grooves formed in the mid-portion of said cylindrical body, said drive pins being resiliently biased toward said opening of said cylindrical body,

whereby rotational motion of either of said cylindrical body and said socket shaft is transmitted to the other by engagement of said cross pin with said drive pins, said engagement being released when said cross pin reaches the bottom of said drive pins, and said cross and drive pins are reengaged by reverse rotation of either of said cylindrical body and socket shaft.

4,006,995

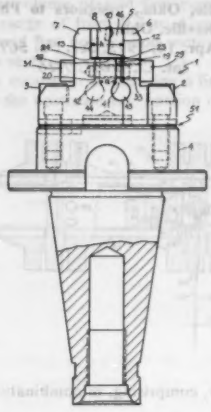
DRILL FOR USE IN A BORING MACHINE

Hans Gruner, Hausen (Fils), Germany

Filed Mar. 10, 1975, Ser. No. 556,883
Claims priority, application Germany, Mar. 9, 1974, 2411394
Int. Cl.² B23B *51/00*
U.S. Cl. 408—157 8 Claims

1. A drill for use in a boring machine comprising a tool holder having a base with spaced walls projecting therefrom having a recess therebetween extending transversely of the axis of the holder, a pair of cutter bars mounted in the recess in end-to-end relation and each having a width substantially equal to the width of the recess and having cutters thereon arranged for radial projection from the periphery of the holder, the base having two noncommunicating slots therein communicating with the recess and extending therefrom in a direction parallel to such axis, and in the same diametrical direction as the recess, and two means located on opposite sides of said central plane each operatively connected with the

parts of the base on opposite sides of each of one of said slots to deform said walls to clamp the cutter bars therebetween the



slots extending from opposite sides of the tool holder approximately to the central plane thereof.

4,006,996

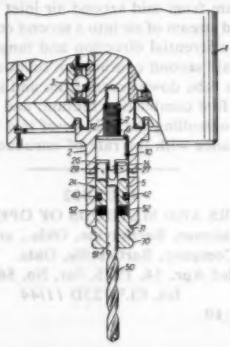
POSITIVELY DRIVEN TOOL HOLDER FOR A HIGH SPEED ROTATABLE SPINDLE

Jack Kasabian, Franksville, Wis., assignor to The Precise Corporation, Racine, Wis.

Filed Dec. 1, 1975, Ser. No. 636,579

Int. Cl.² B23B *31/08, 33/00*

U.S. Cl. 408—239 A **4 Claims**



1. A tool holder for insertion in a smooth, uninterrupted bore of a rotatable spindle and having a free end extending therefrom and for securing a tool therein, said tool holder also having an end for insertion in said rotatable spindle for rotation by said spindle, said tool holder end which is inserted in said spindle having a drive clutch element, said element having drive surfaces circumferentially spaced apart so as to be concentrically balanced, said free end of said tool holder having a diametrically enlarged end which defines an integral shoulder for abutment with an end of said spindle to position said tool holder in said bore, said tool holder also having an axial hole therein for the receiption of a tool, means carried by said tool holder for releasably locking said tool in said tool holder, said tool holder having an annular groove around its periphery, and a flexible o-ring in said groove and is of such size and resiliency so as to project slightly outwardly of the periphery of said tool holder and frictionally abut lightly against said spindle bore when said tool holder is inserted in the bore of said spindle, said o-ring being of such resiliency to be expanded by centrifugal force against said spindle when the latter is rotating.

4,006,997

SUPERSONIC CENTRIFUGAL COMPRESSORS

Jean Friberg, Bourg La Reine, and Jean-Marie Merigoux, Palaiseau, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, France

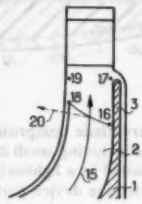
Filed Nov. 6, 1973, Ser. No. 413,224

Claims priority, application France, Nov. 6, 1972, 72.39210

The portion of the term of this patent subsequent to Nov. 13, 1990, has been disclaimed.

Int. Cl.² F04D *21/00*

U.S. Cl. 415—181 **5 Claims**



1. In a supersonic centrifugal compressor for handling fluids at supersonic speed including a drive shaft, a circular mobile flange chocked on said drive shaft and extending radially outwardly, a set of radial blades fixed on said mobile flange along one longitudinal edge thereof in circumferentially spaced relationship and having free edges spaced from said mobile flange, a housing disposed about said flange and said blades in proximity thereto, and a flat ring provided as an extension of said mobile flange beyond said blades defining with said housing a fluid slowing down space, the improvement being comprised in providing the radially outward edge of said radial blades with a configuration such that the distance between the axis of said drive shaft and said radially outward edge of the radial blades is greater in the vicinity of said housing than it is in the vicinity of said mobile flange.

4,006,998

RING COMPRESSOR

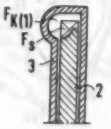
Siegfried Schonwald, Bad Neustadt, Saale, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed July 7, 1975, Ser. No. 593,384

Claims priority, application Germany, July 23, 1974, 2435432

Int. Cl.² F04D *7/00*

U.S. Cl. 415—213 T **1 Claim**



1. A ring compressor having a housing with a side channel impeller for use with said ring compressor, said impeller comprising:

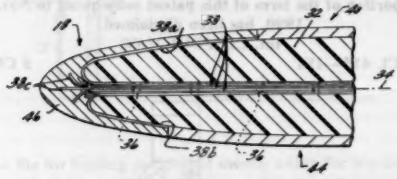
a number of blades, said blades each having a lateral end area whose ratio relative to the axial cross section area of said side channel is equal to or less than 0.72 and each said blade being spaced relative to the next adjacent blade by an amount whose ratio relative to the width dimension of said cross section area is equal to or less than 0.72.

4,006,999

LEADING EDGE PROTECTION FOR COMPOSITE BLADES

James W. Brantley, Cincinnati, and Thomas P. Irwin, Fairfield, both of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed July 17, 1975, Ser. No. 596,905
Int. Cl.² F01D 5/28
U.S. Cl. 416—224 15 Claims



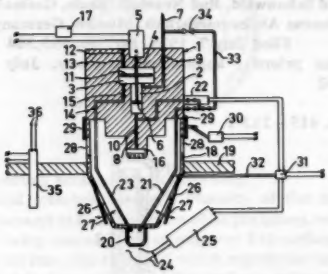
1. A turbomachinery blade comprising:
a primary structure including small diameter, high strength filaments composited in a lightweight matrix; and
a leading edge protective device partially surrounding said primary structure, a portion of which is anchored within said primary structure along a neutral bending axis thereof, wherein the filaments adjacent the anchored portion are aligned substantially radially within said primary structure.

4,007,000

COMPRESSED OIL BURNER STARTING MECHANISM

Johan Holger Graffman, Danderyd, Sweden, assignor to Clean Air Company, Inc., Panama

Filed Nov. 2, 1973, Ser. No. 412,124
Claims priority, application Sweden, Nov. 3, 1972, 14262/72
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976
Int. Cl.² F23C 3/02
U.S. Cl. 431—1 6 Claims



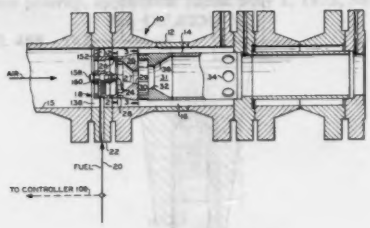
1. In a compressed oil burner, having an operating nozzle comprising a valve body, which is yieldingly loaded against a valve seat in a direction contrary to the flow direction of the fuel, said fuel being supplied at a pulsating pressure, the improvement comprising a separate starting nozzle means arranged in front of said operating nozzle, said starting nozzle means being comprised of an air-fuel mixing chamber with outflow apertures and fuel and combustion air introduction means so that fuel and combustion air are supplied to said chamber while the fuel supply to said operating nozzle is closed.

4,007,001

COMBUSTORS AND METHODS OF OPERATING SAME

Robert M. Schirmer; John W. Vanderveen, and Paul J. Cheng, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 14, 1975, Ser. No. 567,829
Int. Cl.² F02C 7/26
U.S. Cl. 431—10 25 Claims



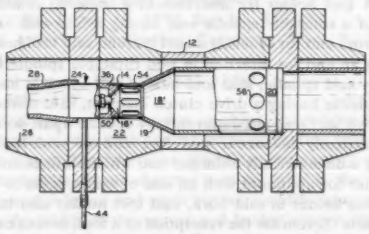
1. A combustor, comprising, in combination:
a flame tube;
a dome member disposed at the upstream end of said flame tube;
a fuel inlet means disposed in said dome member for introducing a stream of fuel into an upstream first combustion section of said flame tube;
a variable first air inlet means provided in said dome member for admitting a variable volume of a first stream of air through said dome member, around said fuel inlet means, and into said first combustion section of said flame tube;
a second air inlet means disposed in the wall of said flame tube for admitting a second stream of air into said first combustion section in a circumferential direction and tangential to the wall thereof;
a third air inlet means disposed in the wall of said flame tube downstream from said second air inlet means for admitting a third stream of air into a second combustion section in a circumferential direction and tangential to the wall thereof, said second combustion section being located in said flame tube downstream from and in communication with said first combustion section; and
means for controlling the volume of said first stream of air in accordance with the rate of introduction of said fuel.

4,007,002

COMBUSTORS AND METHODS OF OPERATING SAME

Robert M. Schirmer, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 14, 1975, Ser. No. 567,830
Int. Cl.² F23D 11/44
U.S. Cl. 431—10 37 Claims



1. A combustor comprising, in combination:
an outer casing;
a flame tube disposed within said casing and spaced apart therefrom to form a first annular chamber between said flame tube and said casing;

said flame tube having an upstream first combustion section, and a second combustion section located downstream from and adjoining said first combustion section, wherein the volume of said first combustion section is within the range of from 0.7 to 4 percent of the total volume of said first combustion section and said second combustion section;

a first air inlet means for introducing a first stream of swirling air into the upstream end portion of said flame tube;

a fuel inlet means for introducing fuel into the upstream end portion of said flame tube; and

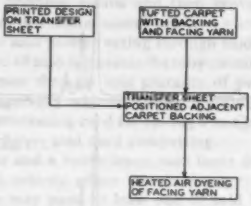
a plurality of openings provided in the wall of said flame tube at a first station located between said first combustion section and said second combustion section for admitting a segmented second stream of air from said annular chamber into the interior of said flame tube.

4,007,003

PRODUCT AND METHOD OF PRINTING CARPET WITH A TRANSFER PAPER- II

Walter T. Bulson; George R. Hartranft, and Leonard N. Ray, Jr., all of Lancaster, Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Sept. 12, 1975, Ser. No. 612,773
Int. Cl.² D06P 5/20
U.S. Cl. 8—2.5 A 3 Claims


PRINTED DESIGN ON TRANSFER SHEET
TUFTED CARPET WITH BACKING AND FACING YARN
TRANSFER SHEET POSITIONED ADJACENT CARPET BACKING
HEATED AIR DYEING OF FACING YARN

1. A process for making a decorative carpet through the use of sublimable dyes comprising the steps of:

a. printing sublimable dyes on a porous transfer sheet,

b. preparing a carpet prouct which has on one side thereof carpet yarn forming the face fiber yarns with an irregular surface to form a sculptured pile

c. placing the transfer sheet adjacent the back of the carpet product on the side of the carpet product opposite from the side of the carpet product having the face fiber yarns so that the transfer sheet with the sublimable dyes printed thereon will be adjacent the back of the carpet product, and

d. transferring the sublimable dyes from the transfer sheet to the carpet face yarn through the application only of a directional flow, heated gaseous medium passing through the transfer sheet and the carpet product in the direction from the transfer sheet towards the back of the carpet product and out the face fiber yarn side of the carpet product.

4,007,004

DYESTUFF FILLER DERIVED FROM KRAFT BLACK LIQUOR

Carl W. Bailey, III, Isle of Palms, and Peter Dilling, Charleston, both of S.C., assignors to Westvaco Corporation, New York, N.Y.

Filed July 5, 1974, Ser. No. 485,787
Int. Cl.² C09B 67/00; C07G 1/08
U.S. Cl. 8—83 9 Claims

1. A material made from the process comprising;

a. acidifying kraft black liquor to pH between 9 and 10 to form a precipitate and a filtrate,

b. separating said filtrate from said precipitate,

c. treating said filtrate with a lignin solubilizing agent to solubilize the remaining lignin,

d. stabilizing said filtrate with a member selected from the group consisting of oxidizing agents and blocking agents, and

e. evaporating water to obtain a filtrate having a solids content of 40 to 65%.

9. A dyestuff composition comprising, a water-dispersible solid dyestuff, a dyestuff dispersant, and the filler material of claim 1.

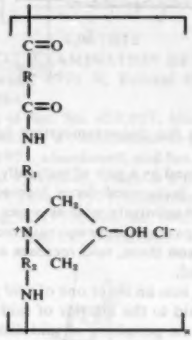
4,007,005

HAIR SETTING COMPOSITIONS WHICH DISPLAY HIGH RESISTANCE TO HIGH HUMIDITY

Kanu I. Patel, Chatsworth, Calif., assignor to Redken Laboratories, Inc., Van Nuys, Calif.

Filed June 19, 1975, Ser. No. 588,383
Int. Cl.² A61K 7/11
U.S. Cl. 8—127.51 14 Claims

1. A sprayable temporary curl setting composition comprising at least one water soluble, reactive polyamide-epichlorohydrin resin having the formula:



wherein R is an alkyl group containing from 1 to about 6 carbon atoms, R_1 and R_2 are independently alkyl groups containing at least 2 carbon atoms, and n is the number of repeating units in the water soluble molecule and at least one water soluble vinylpyrrolidone polymer dissolved in a solvent-carrier for said resin and polymer, wherein the resin and polymer concentration of said composition are independently from about 0.5 to about 8 percent by weight based on the weight of resin, polymer and solvent-carrier and wherein the weight ratio of resin to polymer is from about 1:2 to about 2:1.

4,007,006

MODIFICATION OF WOOL

Mendel Friedman, Moraga, and Nathan H. Koenig, Albany, both of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Sept. 4, 1975, Ser. No. 610,473
Int. Cl.² D06M 13/20
U.S. Cl. 8—128 R 6 Claims

1. A process for chemically modifying wool, which comprises

a. providing a reaction system by immersing dry wool in a mixture containing a wool-modifying reagent, a reaction promoter, and an inert volatile solvent which has a boiling point of about 30° to 60° C., and

b. exposing the reaction system to an ambient temperature of about 100° to 120° C. for about 15 to 60 minutes under conditions which permit evaporation of the inert volatile solvent during the course of the reaction,

wherein the wool-modifying reagent is selected from the group consisting of organic acid anhydrides, organic acid chlorides, organic isocyanates, haloketones, benzyl halides, and epoxides, and

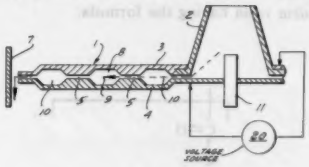
wherein the reaction promoter is selected from the group consisting of dimethylformamide, dimethyl sulfoxide, cresol, methylpyrrolidone, gamma-butyrolactone, and acetic acid.

4,007,007

APPARATUS FOR DECONTAMINATING LIQUIDS OF BACTERIA

Hans Otto Ernst Gazda, Anton Kriegerg. 155, A 1238 Vienna, Austria

Filed Feb. 22, 1974, Ser. No. 444,803
Int. Cl.² A61L *3/00*
U.S. Cl. 21—102 R **1 Claim**



1. An apparatus for decontaminating bacteria-containing liquid comprising:

a rotary disk formed by a pair of vertically spaced horizontal plates having juxtaposed faces formed with registering radially spaced relatively wide recesses and defining relatively narrow passages between said recesses for communicating between them, said recesses and passages being radially aligned;

an inlet opening into an inner one of said passages for delivering said liquid to the interior of said disk;

an outlet along the periphery of said disk for said liquid;

means for rotating said disk at a peripheral speed sufficient to centrifugally displace said liquid at high velocity between said plates, said passages being sufficiently narrow and said recesses being sufficiently wide that said high velocity causes substantial changes in acceleration of said liquid at junctions of said passages with said recesses to destroy bacteria present in the liquid; and

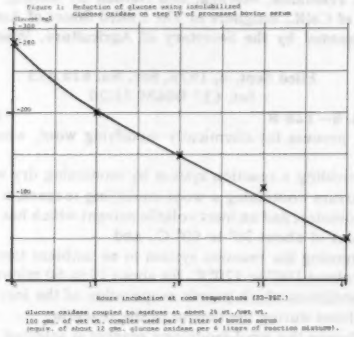
means for applying a voltage of approximately 70 volts to said plates.

4,007,008

PREPARATION OF REFERENCE SERUM FROM ANIMAL BLOOD

Milton J. Becker, 2925 W. Jerome, Chicago, Ill. 60645, and William F. Line, 829 Lathrop, River Forest, Ill. 60305

Filed July 30, 1975, Ser. No. 600,394
Int. Cl.² G01N *33/16*; C09K *3/00*
U.S. Cl. 23—230 B **27 Claims**



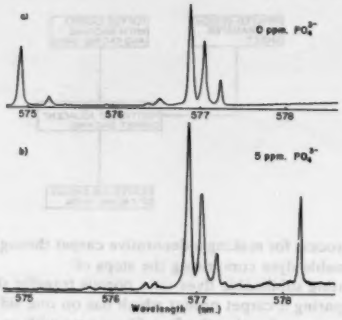
1. A method for reducing enzyme activities in animal serum or plasma comprising the steps of raising the pH of the serum or plasma to a level above normal serum pH by the addition with mixing of a base, and then terminating the reaction for reduction of enzyme activities by neutralizing the serum or plasma with an acidic medium.

4,007,009

CHEMICAL ANALYSIS OF IONS INCORPORATED IN LATTICES USING COHERENT EXCITATION SOURCES

John C. Wright, Oregon, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Feb. 11, 1976, Ser. No. 657,252
Int. Cl.² G01J *1/58*; G01N *33/18*
U.S. Cl. 23—230 R **15 Claims**



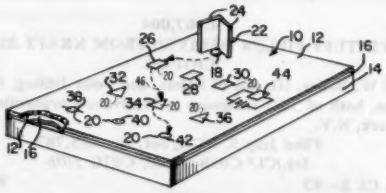
1. A method for analysis of cations and anions comprising incorporating said ions in a crystalline lattice containing ions of a probe which fluoresces upon excitation and which experiences a modification in energy level when said ions to be analyzed differ from that of the probe, exciting the probe ion with a tuneable narrow-band source of coherent light, and monitoring the fluorescence from the excited probe ion to analyze for sites in the spectrum to determine presence of the unknown cations or anions and the intensity of fluorescence thereof for determining the amount of said unknown anions or cations.

4,007,010

BLISTER PLANE APPARATUS FOR TESTING SAMPLES OF FLUID

Richard G. Woodbridge, III, 40 North Road, Princeton, N.J. 08540

Continuation-in-part of Ser. No. 485,548, July 3, 1974, abandoned. This application Apr. 2, 1976, Ser. No. 672,916
Int. Cl.² G01N *27/00*, *31/00*, *33/00*
U.S. Cl. 23—253 R **30 Claims**



1. A blister processing apparatus for testing a sample of fluid, said apparatus comprising:

a blister processing card having an upper level and a lower layer, said layers defining a two dimensional activity plane therebetween through which said sample may pass, at least one of said layers having pliable characteristics;

a blister forming means for introducing a blister sample into said acitivity plane;

a plurality of process station means located in said activity plane;

an exterior pusher means for propelling said sample through said activity plane; and

an inert liquid medium located within said activity plane, said medium being strong enough to prevent the movement of said blister sample in said activity plane solely under the influence of gravity but weak enough to allow said blister sample to pass through said activity plane under the influence of said pusher, there being sufficient medium in said plane so as to substantially exclude contaminants from said plurality of station means,

wherein said sample is introduced into said activity plane by said blister forming means and then moved selectively around said two dimensional activity plane under the influence of said pusher acting through said pliable layer from outside of said apparatus thereby causing said blister sample to pass through said plurality of process station means substantially without contamination.

29. A blister processing card for testing a sample of liquid in the shape of a blister, said card comprising:

an upper layer and a lower layer, said layer defining a two dimensional activity plane therebetween through which said sample may pass, at least one of said layers having pliable characteristics;

a plurality of process station means located in said activity plane; and,

an inert liquid medium located within said activity plane, said medium being strong enough to prevent the movement of said blister sample in said activity plane solely under the influence of gravity, but weak enough to allow said blister sample to pass through said activity plane unde the influence of an external force, there being sufficient medium in said plane so as to substantially exclude contaminants from said plurality station,

wherein said sample is introduced into said activity plane and then moved from outside of said card selectively around said two dimensional activity plane thereby causing said blister sample to pass through said plurality of process station means located in said activity plane substantially without contamination.

4,007,011

SPECIMEN TREATMENT APPARATUS

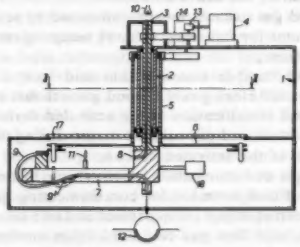
Geoffrey Stuart Greaves, and Roger Abraham Bunce, both of Birmingham, England, assignors to The Secretary of State for Social Services in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Apr. 29, 1975, Ser. No. 572,716

Claims priority, application United Kingdom, May 8, 1974, 20389/74

Int. Cl.² B01F *11/00*; G01N *21/00*

U.S. Cl. 23—259 **10 Claims**



1. Specimen agitation apparatus comprising a substantially horizontal turntable having a relatively high moment of inertia and mounted to rotate about an upright central axis and formed to carry in fixed relation thereto in use, at respective positions substantially equally spaced from the said central axis and distributed substantially uniformly about the said central axis, a plurality of vessels for receiving liquid specimens to be agitated, and stepping drive means connected by means of a belt to the turntable to bring about stepwise rotation thereof about the said central axis, the stepping drive means being arranged to apply driving impulses to the turntable to bring about rotation thereof, and the stepping drive means and the turntable being so arranged that when the turntable is in a first rotational position about the said central axis and a driving impulse is applied to the turntable by the stepping drive means the turntable rotates to a second rotational position about the said central axis whereby the inertia of said turntable and the belt cause said turntable, before coming to rest at the second rotational position, to oscillate about the said central axis and thereby agitate specimens in vessels carried by the turntable.

4,007,012

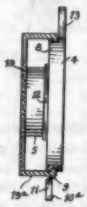
FECAL EXAMINATION DEVICE

Robert J. Greenwald, 4771 N. Federal Highway, Pompano Beach, Fla. 33064

Continuation of Ser. No. 455,017, March 26, 1974, abandoned, which is a continuation-in-part of Ser. No. 150,357, June 7, 1971, abandoned, and Ser. No. 255,857, May 22, 1972, Pat. No. 3,819,045, which is a continuation-in-part of Ser. No. 150,357, June 7, 1971, abandoned. This application Aug. 4, 1975, Ser. No. 601,723

Int. Cl.² B01L *3/00*

U.S. Cl. 23—259 **7 Claims**



1. A fecal sample container for collecting and transporting a sample of feces and for serving as a base, for an open-ended tube subsequently fitted thereto, during the analysis of said sample by a method in which the sample of feces is mixed with flotation liquid in a receptacle formed by said tube and said base and ova in said sample are caused to rise upward through said liquid in said receptacle, said container consisting of two unitary bodies, both of molded plastic, one of which is a unitary cup body including an empty open-top cup adapted to receive and transport the sample of feces to be examined, said cup being adapted to be slid into and received in an open lower end of said tube to form said receptacle by closing the lower end of said tube with a liquid-tight press fit with the outer walls of said cup in close contact with the inner walls of said tube, said cup having an interior volume of about one half to 5 cc for receiving and retaining a corresponding volume of feces and a width of about 1 to 2 cm and said cup having an integral extension in the form of a flat-bottomed tray having an upstanding outer rim, said tray being constructed and arranged to serve as a supporting base for said tube when the latter is fitted to said cup and said rim being constructed and arranged to retain liquid overflowing from said tube, the top of said rim being below the top of said cup, the other of said unitary bodies being a closure cap for fitment over the open top of the cup, said closure cap engaging and spanning said spaced portions and extending over the top of said cup to confine fecal matter therein during the transport of said sample prior to the fitting of said receptacle on said cup, said closure cap having a downwardly extending circumferential wall surrounding said rim and having means for engaging said rim with a snap fit to hold said cap on said body with said cap fitting over the entire top of said tray, closing said cup and covering the space between said well and said rim, said cup body having an extension outwardly of said rim serving as a finger piece for use in separating said cup body and said clo-

sure cap prior to the fitting of said receptacle on said cup, one of said unitary bodies having integral therewih a feces sample-collecting paddle whose width is at least one fifth of, but less than, the inner diameter of said cup, said paddle being connected to said cup or closure cap by a narrower readily frangible zone and thereby being easily removed for use in collecting said sample.

4,007,013

HOLDER DEVICE FOR SAMPLE VIALS OR THE LIKE FOR AN ANALYSIS APPARATUS

Karl Kotacka, Zurich, Switzerland, assignor to Contraves AG, Zurich, Switzerland

Filed July 9, 1976, Ser. No. 703,844

Claims priority, application Switzerland, Sept. 22, 1975, 12276/75

Int. Cl.² G01N 33/16; B01L 9/06

U.S. Cl. 23—259 **7 Claims**

1. A holder device for sample vials for an analysis apparatus, especially a blood cell counter, equipped with a suction tube which can be immersed in a sample vial filled with a liquid sample for removing the sample therefrom, comprising a holder body having means defining a recess for receiving and holding a sample vial, said means defining said recess comprising a rear wall extending approximately parallel to the central axis of the recess and two side walls extending from a lower edge to an upper edge of the holder body, said two side walls upwardly tapering with regard to the rear wall from the lower edge to the upper edge, and a standing surface for the sample vial arranged transversely with respect to the rear wall.

4,007,014

ACTIVATED CARBON REVIVIFICATION EQUIPMENT

Zenji Matsumoto, Osaka; Kiyoshi Adachi; Toyohisa Fujimoto, both of Shizuoka, and Nobutaka Ninomiya, Kyoto, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 432,312, Jan. 10, 1974, abandoned. This application Nov. 21, 1975, Ser. No. 634,442

Claims priority, application Japan, Jan. 16, 1973, 48-7484

Int. Cl.² B01J 8/12, 21/18; C10B 47/20

U.S. Cl. 23—277 R **4 Claims**

1. An apparatus for revivification of activated carbon by direct and indirect heating comprising:

a first cylindrical compartment having a vertical central axis;

at least one heating means directed into said first compartment for heating said first compartment;

a first reactor gas supply means directed into said first compartment for supplying reactor gas thereto during direct revivification of the activated carbon, said first reactor gas supply means stopping the supplying of reactor gas during indirect revivification of the activated carbon;

a first gas exhaust means connected to said first compartment means for removing exhaust reactor gases and vapors therefrom;

a first damper means provided into said first gas exhaust means for closing said first gas exhaust means during direct revivification of the activated carbon and opening said first gas exhaust means during indirect revivification of the activated carbon;

a second cylindrical compartment concentrically within and extending through said first compartment;

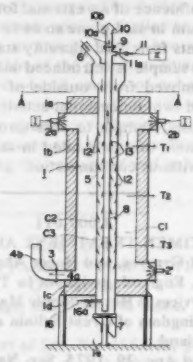
activated carbon supply means for supplying activated carbon to be revivified connected to the top of said second compartment;

carbon removal means at the bottom of said second compartment for removing the revivified activated carbon therefrom;

a third cylindrical compartment concentrically within said second compartment;

guide means within said second compartment for guiding said activated carbon being revivified through said second compartment, said guide means comprised of a plurality of baffles staggered with respect to each other on the inside wall of said second compartment and the outside wall of said third compartment downwardly inclined at an angle to the central axis sufficient to prevent the activated carbon supplied to the second compartment from being retained thereby as it collides with said baffles while falling through said second compartment and positioned so that the carbon is directed essentially vertically through the second compartment;

a second reactor gas supply means operatively connected to



said third compartment for supplying reactor gas to said third compartment during indirect revivification of said activated carbon, said second reactor gas supply means stopping the supplying of reactor gas during direct revivification of the activated carbon;

a second gas exhaust means connected to said third compartment for removing exhaust reactor gases and vapors therefrom;

a second damper means within said second gas exhaust means for closing said second gas exhaust means during indirect revivification of the activated carbon and opening said second gas exhaust means during direct revivification of the activated carbon;

a first gas communication means through the wall of said second compartment for communicating gas and vapor between said first compartment and said second compartment, said first gas communication means being comprised of a plurality of ducts through said second compartment wall;

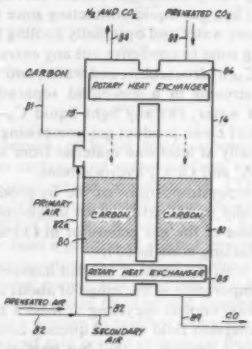
a second gas communication means within the wall of said third compartment for communicating gas and vapor between said third compartment and said second compartment, said second gas communication means being comprised of a plurality of ducts through said third compartment wall, whereby during direct revivification of said activated carbon, reactor gas from said first reactor gas supply means enters said first compartment, flows

through said first gas communication means to said second compartment, wherein said reactor gas reacts with the activated carbon, and flows through said second gas communication means to said third compartment where it is removed therefrom through said second gas exhaust means, and whereby during said indirect revivification process said reactor gas from said second reactor gas supply means enters said third compartment, flows through said second gas communication means to said second compartment where it reacts with said activated carbon, and then flows through said first gas communication means to said first compartment where it is removed therefrom through said first gas exhaust means.

4,007,015
APPARATUS USEFUL FOR THE PRODUCTION OF HYDROGEN

Everett M. Barber, Wappingers Falls, N.Y., assignor to Texaco Inc., New York, N.Y.

Division of Ser. No. 532,338, Dec. 13, 1974. This application Dec. 17, 1975, Ser. No. 641,854
Int. Cl.² B01J 7/00; C01B 1/02, 31/18
U.S. Cl. 23—281 1 Claim

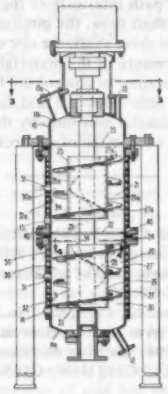


1. A combination reactor useful for the combustion of carbon with air to produce a combustion gas effluent containing carbon dioxide and nitrogen and useful for reacting carbon dioxide with carbon to produce carbon monoxide comprising in a unitary structure, first and second zones, said first zone being adapted to contain a first bed of particle-form carbonaceous material, first air supply means associated with said first zone for the introduction of air into the lower portion thereof, second air supply means for the introduction of air into said first zone into the upper portion thereof, first means for supplying particle-form carbonaceous material into said first zone into the upper portion thereof to form said first bed of carbonaceous material therein, combustion gas effluent conduit means associated with the upper portion of said first zone for the withdrawal of combustion gas effluent therefrom, said second zone being adapted to contain a second bed of particle-form carbonaceous material therein, carbon dioxide supply means associated with said second zone for the introduction of gaseous carbon dioxide into the upper portion thereof, second means for supplying particle-form carbonaceous material into said second zone into the upper portion thereof to form said second bed of carbonaceous material therein, carbon monoxide-containing reaction gas effluent conduit means associated with the lower portion of said second zone for the withdrawal of carbon monoxide-containing gaseous effluent from said second zone, first and second rotatable heat exchangers associated with said first and second zones, said first rotatable heat exchanger being located in the upper portion of each of said first and second zones for movement therein above said beds of particle-form carbonaceous material therein and above said first and second means for supplying particle-form carbonaceous material to said first and second zones, respectively, and said second rotatable heat exchanger being located in the lower portion of each of said first and second zones for movement therein below said beds of particle-form carbonaceous material therein and above said first air supplying means associated with said first zone for the introduction of air into the lower portion thereof and above said reaction gas effluent conduit means associated with said second zone for the withdrawal of carbon monoxide-containing gaseous effluent therefrom.

4,007,016
CONTINUOUS-FLOW REACTOR FOR HIGH VISCOSITY MATERIALS

Arthur P. Weber, New York, N.Y., assignor to The Bethlehem Corporation, Bethlehem, Pa.

Filed Mar. 6, 1975, Ser. No. 555,807
Int. Cl.² B01F 7/16, 7/24; B01J 3/04
U.S. Cl. 23—285 4 Claims



1. A reactor for continuous processing of high viscosity materials comprising:

an elongated hollow vessel having a longitudinal axis, longitudinal side wall means, transverse end wall means, an inlet at one end, an outlet at the opposite end for the introduction and discharge of the process material under pressure, and a rotary drive shaft extending through said vessel along said longitudinal axis;

a plurality of flat imperforate transverse barrier plates within said vessel and forming, in conjunction with the vessel wall means, at least two reaction stages, the first stage disposed adjacent said inlet and a second stage adjacent the outlet, one of said barrier plates having clearance between its outer periphery and the longitudinal vessel side wall to constitute an end orifice providing a restricted passage for uniform egression of a first portion of the material from the first stage in a direction away from said inlet and into said second stage at a predetermined fixed rate, another of said barrier plates having clearance between its outer periphery and the longitudinal vessel side wall to constitute an end orifice providing a restricted passage adjacent to said outlet for the uniform egression of a predetermined portion of the process material from the second stage in a direction away from said inlet and towards said outlet;

mixing means mounted within each reaction stage on said elongated drive shaft, said shaft driving said mixing means at a given speed for homogeneously agitating and recirculating a second portion of the process material which

remains in each stage after egression of said first portion from said stage, said mixing means comprising:

a longitudinal draft tube mounted concentrically on said shaft, said draft tube being spaced from the wall means forming said stage and defining a continuous recirculating flow path for process material within the stage, said path including an advancing annular passage between said tube and the longitudinal side wall means of the vessel and a return annular passage within said tube;

a helical screw having a pitch in one direction with its axis longitudinal mounted concentrically on said drive shaft and extending between the drive shaft and the draft tube; and

helical agitator means having a pitch opposite to that of the helical screw mounted with its axis longitudinal and mounted concentrically on said drive shaft in the space between the draft tube and vessel longitudinal side wall means,

whereby in each stage upon driving said drive shaft, said agitator advances the first and second portions of the process material in said advancing passage of said path exteriorly of the tube and said helical screw returns said second portion of the process material in said return passage of said path interiorly of the tube,

the width of said shaft tube, the pitch of said helical screw, the speed of said drive shaft, the size of the orifice and the viscosity and pressure of the material introduced through said inlet cooperating to control the flow in said path and determine the ratio between said first and second portions of said material and thereby the residence time of the material in each stage of said reactor.

4,007,017

PRODUCTION OF CLEAN SYNTHESIS OR FUEL GAS

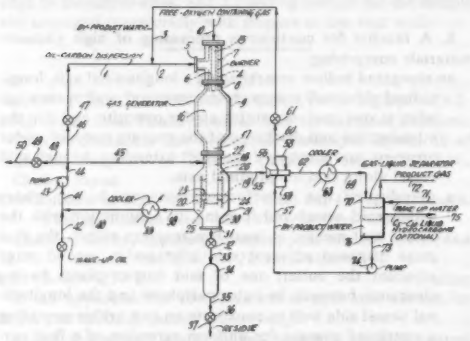
William L. Slater; George N. Richter; William B. Crouch, and Lawrence E. Estabrook, all of c/o Texaco Inc. P.O. Box 400, Montebello, Calif. 90640

Filed Dec. 22, 1975, Ser. No. 643,069

The portion of the term of this patent subsequent to Feb. 8, 1994, has been disclaimed.

Int. Cl.[2] C10J *3/00*; C10K *1/08*

U.S. Cl. 48—197 R **11 Claims**



1. A continuous process for producing clean gaseous mixtures comprising H_2, CO, CO_2, H_2O, and optionally at least one gas from the group H_2S, COS, N_2, A, and C_1–C_4 hydrocarbons, while simultaneously disposing of by-product water produced by the process comprising:

1. reacting in the reaction zone of a free-flow, unpacked gas generator as feed a dispersion of particulate carbon and liquid hydrocarbonaceous fuel, a stream of free-oxygen-containing gas selected from the group consisting of air, oxygen-enriched air i.e. at least 22 mole % oxygen, and substantially pure oxygen i.e. at least 95 mole % oxygen, wherein the ratio of free-oxygen in the free-oxygen containing gas to carbon in the feedstock (O/C atom/atom) is in the range of about 0.6 to 1.5; and a temperature moderator comprising at least a portion of the by-product water produced subsequently in step (3) (a), by partial oxidation at a temperature in the range of about 1300° to 3000° F and a pressure in the range of about 1 to 250 atmospheres thereby producing an effluent gas stream containing H_2, CO, CO_2, H_2O, particulate carbon, and optionally at least one gas from the group H_2S, COS, N_2, CH_4 and A;

2. cooling the effluent gas stream from (1) to a temperature in the range of about 300° to 900° F but above the dew point of the water in the gas and simultaneously removing said particulate carbon by discharging said effluent gas stream directly into a body of hot immersion fluid contained in a quench zone and comprising a dispersion of liquid hydrocarbonaceous fuel and particulate carbon, wherein said quench zone contains 30 to 60 gallons of immersion fluid maintained at a temperature in the range of about 300° to 850° F for each 1000 Standard Cubic Feet of effluent gas from the gas generator that is quenched therein, and removing from said quench zone a clean gaseous stream comprising H_2, CO, CO_2, H_2O, particulate carbon and optionally at least one material from the group H_2S, COS, N_2, A, and C_1–C_{10} hydrocarbons;

3. contacting the process gas stream leaving the quench zone in (2) in a gas-liquid contacting zone with a portion of by-product water and optionally cooling the gas stream in a cooling zone to condense out any entrained normally liquid C_5–C_{10} hydrocarbons and water, and separating the following streams in a gas-liquid separation zone: (a) by-product water, (b) any light liquid C_5–C_{10} hydrocarbons, and (c) clean product gas comprising H_2, CO, CO_2, and optionally at least one material from the group H_2S, COS, N_2, A, and C_1–C_4 hydrocarbons;

4. recycling separate portions of the by-product water (3) (a) optionally in admixture with make-up water, to the reaction zone of the gas generator in (1) and to the gas-liquid contacting zone in (3);

5. cooling at least a portion of the hot immersion fluid from (2) to a temperature in the range of about 300° to 850° F. in an external cooler, recycling at least a portion of said cooled immersion fluid to said quench zone; and

6. introducing a portion of said hot immersion fluid from (2) or a portion of said cooled immersion fluid from (5) into the reaction zone in (1) as at least a portion of said dispersion of particulate carbon in liquid hydrocarbonaceous fuel.

4,007,018

PRODUCTION OF CLEAN SYNTHESIS OR FUEL GAS

William L. Slater, La Habra; George N. Richter, San Marino; William B. Crouch, Whittier, and Lawrence E. Estabrook, Long Beach, all of Calif., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 22, 1975, Ser. No. 643,458

The portion of the term of this patent subsequent to Feb. 8, 1994, has been disclaimed.

Int. Cl.[2] C10J *3/00*; C10K *1/08*

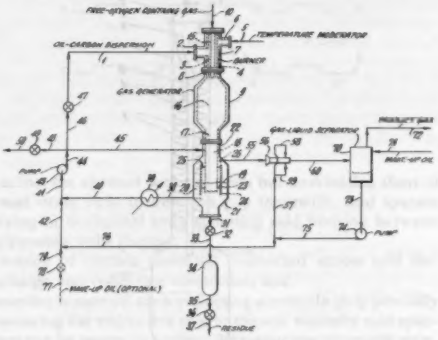
U.S. Cl. 48—197 R **13 Claims**

1. A continuous process for producing clean synthesis or fuel gas comprising:

1. Introducing into the reaction zone of a freeflow, unpacked gas generation zone as feed materials a dispersion of particulate carbon in liquid hydrocarbonaceous fuel, a stream of free-oxygen-containing gas selected from the group consisting of air, oxygen-enriched air i.e. at least 22 mole % oxygen, and substantially pure oxygen i.e. at least 95 mole % oxygen, wherein the ratio of free-oxygen in the free-oxygen containing gas to carbon in the feedstock (O/C atom/atom) is in the range of about 0.6 to 1.5, and optionally a temperature moderator selected from the group consisting of H_2O, CO_2, flue gas, a portion of

cooled and recycled effluent gas from the gas generator, and mixtures thereof, and reacting said feed materials by partial oxidation at a temperature in the range of about 1300° to 3000° F and a pressure in the range of about 1 to 250 atmospheres, thereby producing an effluent gas stream containing H_2, CO, CO_2, H_2O, particulate carbon, and optionally at least one gas from the group H_2S, COS, N_2, A and CH_4;

2. cooling the effluent gas stream from (1) to a temperature in the range of about 300° to 900° F but above the dew point of water in said gas stream and simultaneously removing said entrained particulate carbon by discharging said effluent gas stream directly into a body of hot immersion fluid contained in a quench zone and comprising a dispersion of liquid hydrocarbonaceous fuel and particulate carbon, and removing from said quench zone a clean gaseous stream comprising H_2, CO, CO_2, H_2O and optionally at least one material from the group particulate carbon, H_2S, COS, N_2, A, and $C_1 - C_{10}$ hydrocarbons;
3. cooling at least a portion of the hot immersion fluid from (2) to a temperature in the range of about 300° to 850° F in an external cooler and recycling at least a portion of the cooled immersion fluid to said quench zone; and (4) introducing a portion of said hot immersion fluid from (2) or a portion of said cooled immersion fluid from (3) into said gas generation zone in (1) as at least a portion of said dispersion of particulate carbon in liquid hydrocarbonaceous fuel.



4,007,019

PRODUCTION OF CLEAN SYNTHESIS OR FUEL GAS

William L. Slater, La Habra; George N. Richter, San Marino; William B. Crouch, Whittier, and Lawrence E. Estabrook, Long Beach, all of Calif., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 22, 1975, Ser. No. 643,561

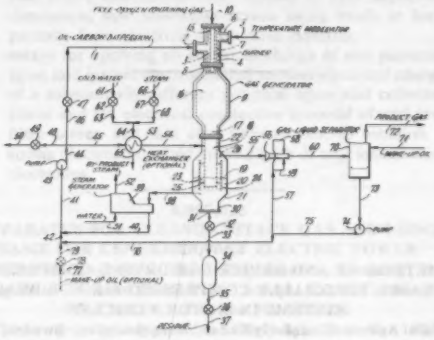
The portion of the term of this patent subsequent to Feb. 8, 1994, has been disclaimed.

Int. Cl.² C10J *3/00*; C10K *1/08*

U.S. Cl. 48—197 R **14 Claims**

1. A continuous process for producing clean synthesis or fuel gas comprising:

1. introducing into the reaction zone of a free-flow, unpacked gas generation zone as feed materials a dispersion of particulate carbon in liquid hydrocarbonaceous fuel, a stream of free-oxygen-containing gas selected from the group consisting of air, oxygen-enriched air, i.e. at least 22 mole % oxygen, and substantially pure oxygen, i.e. at least 95 mole % oxygen, wherein the ratio of free-oxygen in the free-oxygen-containing gas to carbon in the feedstock (O/C atom/atom) is in the range of about 0.6 to 1.5, and optionally a temperature moderator selected from the group consisting of H_2O, CO_2, flue gas, a portion of cooled and recycled effluent gas from the gas generator, and mixtures thereof, and reacting said feed materials by partial oxidation at a temperature in the range of about 1300° to 3000° F. and a pressure in the range of about 1 to 250 atmospheres, thereby producing an effluent gas stream containing H_2, CO, CO_2, H_2O, particulate carbon, and optionally at least one gas from the group H_2S, COS, N_2, A and CH_4;
2. cooling the effluent gas stream from (1) to a temperature in the range of about 300° to 900° F. but above the dew point of water in said gas stream and simultaneously removing said entrained particulate carbon by discharging said effluent gas stream directly into a body of hot immersion fluid contained in a quench zone and comprising a dispersion liquid hydrocarbonaceous fuel and particulate carbon, and removing from said quench zone a clean gaseous stream comprising H_2, CO, CO_2, H_2O and optionally at least one material from the group particulate carbon, H_2S, COS, N_2, A, and $C_1 - C_{10}$ hydrocarbons;
3. cooling at least a portion of the hot immersion fluid from (2) to a temperature in the range of about 300° to 850° F. by indirect heat exchange with water in an external heat exchange zone thereby producing by-product steam and cooled immersion fluid, and recycling at least a portion of said cooled immersion fluid to said quench zone; and
4. introducing a portion of said hot immersion fluid from (2) or a portion of said cooled immersion fluid from (3) into said gas generation zone in (1) as at least a portion of said dispersion of particulate carbon in liquid hydrocarbonaceous fuel.



4,007,020

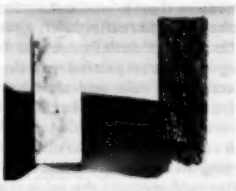
REFRACTORY ABRASIVE BODY CONTAINING CHROMIUM OXIDE AND METHOD OF PRODUCING IT

Peter K. Church, Cascade, and Oliver J. Knutson, Colorado Springs, both of Colo., assignors to Kaman Sciences Corporation, Colorado Springs, Colo.

Continuation of Ser. No. 7,949, Feb. 2, 1970, abandoned, which is a division of Ser. No. 694,303, Dec. 28, 1967, Pat. No. 3,789,096. This application Nov. 19, 1973, Ser. No. 417,241

Int. Cl.² B24D *3/16*, *3/18*

U.S. Cl. 51—295 **45 Claims**



40. A chemically hardened abrasive body comprising:

a closely packed porous mass of a substantial amount of abrasive grain and finely divided discrete particles at least the surface of which consists of a refractory oxide of at least one metallic element having a vitrification temperature in excess of 600° F. essentially devoid of vitreous and/or sinter bonding between the particles with said particles being bonded together by chromic oxide at temperatures below vitrification temperature of the refractory oxide and grain and having substantial deposits of chromic oxide within the pores thereof.

4,007,021

METHOD OF AND DEVICE FOR DRYING COMPRESSED GASES, ESPECIALLY COMPRESSED AIR FOR BRAKE SYSTEMS IN MOTOR VEHICLES

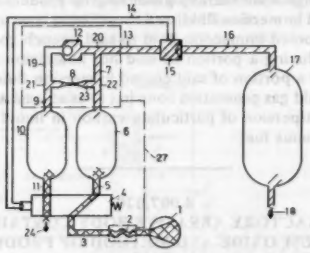
Lars Anders Gustaf Gyllinder, Norrahammar, Sweden, assignor to Svenska Luftkompressor AB, Norrahammar, Sweden

Filed May 8, 1975, Ser. No. 575,499

Claims priority, application United Kingdom, May 14, 1974, 21169/74

Int. Cl.² B01D *53/04*

U.S. Cl. 55—33 **5 Claims**



1. A method of drying compressed gases in a treatment system having two treatment chambers, an inlet supply for moist compressed gas and an outlet valve for useful dried compressed gas, each of said treatment chambers having a regeneratable drying medium therein, comprising passing all of the gas from the inlet supply through one of said treatment chambers to dry the gas, diverting a minor part of the dried gas from said one chamber through the other chamber to regenerate the drying medium therein and exhausting the spent gas from said other chamber, thereafter interrupting the discharge of the dried gas through the outlet valve and during said interruption supplying moist compressed gas through said inlet supply, disconnecting the said one chamber from the inlet supply, connecting said other chamber to the inlet supply to dry the gas, diverting all of the dried gas from said other chamber through said one chamber to obtain maximum regeneration of the drying medium therein and exhausting the spent gas, and thereafter reconnecting the inlet supply to said one drying chamber when discharge of useful dried gas from said one chamber through the outlet valve is resumed.

4,007,022

PROCESS FOR THE REMOVAL OF GASEOUS MONOMERS FROM POLYVINYL CHLORIDE-WATER DISPERSIONS

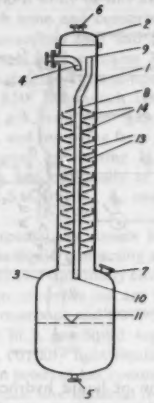
Rudolf Schleicher, Hamm, Marl; Juergen Walther; Karl-Heinz Schoenberg, both of Marl, and Peter Rauth, Bochum, all of Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Germany

Filed Aug. 28, 1975, Ser. No. 608,699

Claims priority, application Germany, Aug. 29, 1974, 2441304

Int. Cl.² B01D *19/00*

U.S. Cl. 55—41 **4 Claims**



1. A process for lowering the gaseous monomer content of solid-liquid dispersions obtained during the manufacture of polyvinyl chloride according to the suspension or emulsion method, comprising the steps of:

flowing the dispersion over a succession of inclined surfaces forming an angle of about 45° to 80° with the vertical at temperatures of about 30°–90° C in a layer thickness of about 0.5 – 5 mm during a period of about 2–20 seconds; collecting the remaining dispersion and the gaseous phase of the monomers liberated by the flowing step; and removing the thus-liberated gaseous monomer directly from the interface between the dispersion and the gaseous phase of the monomers.

4,007,023

ELECTROSTATIC PRECIPITATOR WITH COLLECTOR-ELECTRODE SPACERS

Willi Bätza; Günter Baier, both of Offenbach, and Hermann Schmidt, Bergen-Enkheim, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed July 11, 1975, Ser. No. 595,082

Claims priority, application Germany, July 12, 1974, 2433596

Int. Cl.² B03C *3/76*

U.S. Cl. 55—112 **6 Claims**

1. A dust-collection electrostatic precipitator comprising:

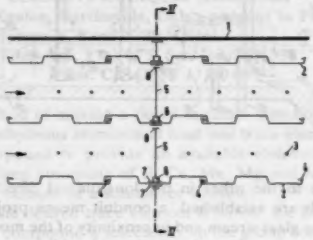
a housing;

a plurality of upright parallel collecting electrodes in transversely spaced relationship within said housing and defining gas channels between them, each of said collecting electrodes being formed with a common carrier at the top thereof, a rapping member along the bottom of the collecting electrode, and a multiplicity of collecting-electrode strips secured at their tops to said carrier and at their bottoms to said member, said strips having adjacent lateral edges loosely hooked one into another, the end strips of each collecting electrode being engaged by pro-

filed supporting members extending over the entire height of the collecting-electrode strips;

arrays of discharge electrodes between said collecting electrodes;

spacers interposed between the individual collecting-electrode strips of said collecting-electrodes, each of said spacers projecting from a strip of one collecting electrode toward an opposing strip of another collecting electrode



across the channel between them but terminating short of said other strip to define a gap therewith, said spacers lying in horizontal rows spanning said housing between opposing walls thereof;

a source of electric potential connected across said discharge and collecting electrodes; and

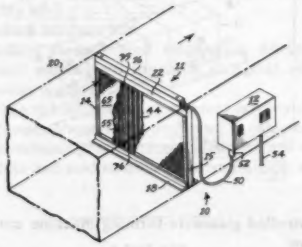
mounting means on each collecting-electrode strip pivotally securing the respective spacer thereto whereby said spacers can be swung up against the respective electrode strip.

4,007,024

PORTABLE ELECTROSTATIC AIR CLEANER

John P. Sallee; Bill W. Speight, and Bruce H. McLain, all of Nashville, Tenn., assignors to Air Control Industries, Inc., Nashville, Tenn.

Filed June 9, 1975, Ser. No. 584,958
Int. Cl.² B03C *3/01*
U.S. Cl. 55—126 **5 Claims**



1. A portable electrostatic air cleaning device comprising:

a. a frame having longitudinal, widthwise, and depthwise dimensions, an upstream end and a downstream end spaced depthwise from each other, said depthwise dimension being substantially less than said other dimensions so that said frame may be mounted in an air conduit transversely of the air flow,

b. a plurality of elongated ionizer wire electrodes,

c. means mounting said ionizer wire electrodes longitudinally within said frame and spaced apart in a plane widthwise of said frame between said upstream and downstream ends,

d. a plurality of narrow, elongated collector plates,

e. plate mounting means supporting said collector plates longitudinally within said frame between said upstream and downstream ends, each of said plates being spaced widthwise of said frame and intercepting the plane of said ionizer wire electrodes,

f. each of said ionizer wire electrodes being spaced substantially midway between a pair of said collector plates,

g. said plate mounting means supporting said collector plates substantially parallel to each other and at acute angles to said depthwise dimension, to lengthen the air flow paths through said frame from said upstream end to said downstream end,

h. a pre-filter screen mounted in said upstream end of said frame substantially normal to said depthwise dimension, said pre-filter screen being made at least partially from electrical conductive material,

i. an after-filter screen mounted in said downstream end of said frame and substantially normal to said depthwise dimension, said after-filter screen being made at least partially from electrical conductive material,

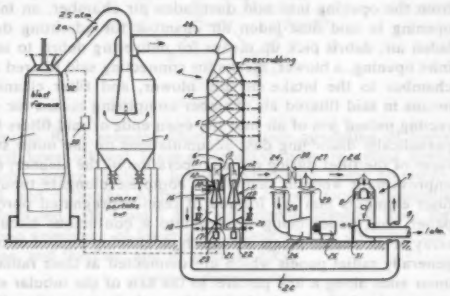
j. means for applying an electrical charge of one potential upon said ionizer electrodes and another electrical charge of a substantially different potential upon said collector plates and the electrical conductive material of said pre-filter screen and said after-filter screen, to establish a strong electrostatic field around each of said ionizer wire electrodes.

4,007,025

APPARATUS FOR CLEANING STACK GAS AND USING SAME FOR GENERATION OF ELECTRIC POWER

Karl-Rudolf Hegemann, Essen-Bergerhausen, Germany, assignor to Gottfried Bischoff Bau Kompl., Essen, Germany

Filed Nov. 4, 1974, Ser. No. 520,920
Claims priority, application Germany, Nov. 6, 1973, 2355457; Aug. 20, 1974, 2439757; Aug. 20, 1974, 2439758
Int. Cl.² B01D *47/10*
U.S. Cl. 55—213 **5 Claims**



1. An apparatus for cleaning stack gas from a blast furnace, said apparatus comprising:

a first conduit having an input end connected to said blast furnace for collecting therefrom stack gas under pressure;

particle separating means having an inlet connected to said first conduit for removing particles from said gas, said particle separating means having an outlet for the gas from which particles have been removed;

a second conduit connected to said outlet;

means connected to said second conduit downstream of said means for removing particles for scrubbing said gas, said scrubbing means having an outlet;

a variable Venturi washer having an inlet communicating with said outlet of said scrubbing means and an outlet opening downstream of said inlet of said washer for reducing the pressure of and for scrubbing said gas;

at least one other Venturi washer having an inlet communicating with said outlet of said scrubbing means and an outlet for reducing the pressure of and for scrubbing said gas;

an expansion turbine having an input side connected to the outlet of said at least one other Venturi washer and an output side for discharging expanded gas;

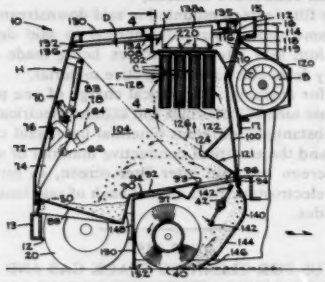
a generator operatively connected to said turbine; and

means including means for detecting gas pressure at said input end of said first conduit for varying the flow cross-section of said variable Venturi washer to maintain said pressure at said end constant.

4,007,026
COMPACT DUST FILTER SYSTEM

Andrew F. Groh, Cupertino, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Aug. 13, 1975, Ser. No. 604,275
Int. Cl.² B01D 46/04
U.S. Cl. 55—302 **5 Claims**



2. In a surface cleaner which picks up debris that includes dust particles, said cleaner being a self propelled mobile vehicle comprising an enclosure, a partition for dividing the enclosure into a dust laden air chamber and a filtered air chamber, said partition having a plurality of openings therein, a filter unit comprising a plurality of porous filters, each filter having one open end connected to a partition opening and projecting from the opening into said dust laden air chamber, an inlet opening in said dust laden air chamber for admitting dust laden air, debris pick up means for delivering debris to said inlet opening, a blower, means for connecting said filtered air chamber to the intake of said blower, and filter cleaning means in said filtered air chamber comprising means for directing pulsed jets of air into the open ends of said filters for periodically dislodging dust accumulations on the outer surfaces of the filter during normal operation of the cleaner; the improvement wherein said filters comprise elongate tubular filter elements that are formed of resin-impregnated porous paper, said paper being formed into a continuous circular array of connected pleats with each pleat being formed of two generally radial panels which are connected at their radially inner ends along a line parallel to the axis of the tubular element and which panels diverge from their connection line such as to form an exterior included angle between the panels in the range of 20° to about 35°, the peripheries of said elements being spaced from one another.

4,007,027
METHOD AND APPARATUS FOR MAKING GLASS

Magnus L. Froberg, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation-in-part of Ser. No. 526,876, Nov. 25, 1974, abandoned. This application Feb. 12, 1976, Ser. No. 657,651
Int. Cl.² C03B 5/18
U.S. Cl. 65—136 **4 Claims**

1. A method of thermally mixing an additive into a stream of molten glass flowing through a forehearth channel comprising,

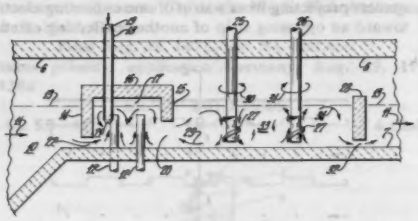
a. establishing a first thermally rising convective current within said stream of molten glass.

b. causing said flowing stream of molten glass to approach the first upstream thermal convective current low in the forehearth channel,

c. introducing said additive into the first convectively rising current of glass at a point below the surface level of molten glass within the forehearth channel,

d. subjecting the resulting glass system to at least one additional thermally rising convective current.

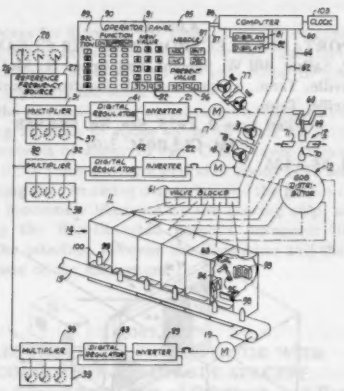
3. Apparatus for thermally mixing an additive substance into a molten host glass stream flowing through a forehearth channel comprising a multiplicity of heating electrodes submerged beneath the stream level and configured such that at least two upward rising thermal currents in tandem arrangement one to the other in the longitudinal direction of the forehearth are established, a conduit means projecting into the molten glass stream and in proximity of the most upstream thermal current through which said additive substance is injected into said host glass stream.



4,007,028
ELECTRONICALLY CONTROLLED GLASSWARE-FORMING MACHINE

Arthur T. Bublitz, Ann Arbor, Mich., and Gerald A. Jakes, Toledo, Ohio, assignors to Reliance Electric Company, Pepper Pike, Ohio

Filed Sept. 30, 1975, Ser. No. 618,010
Int. Cl.² C03B 9/40
U.S. Cl. 65—163 **17 Claims**



1. A controlled glassware-forming machine comprising, in combination:

a plurality of individual machine sections each having means to individually form glassware,

fluid actuators connected to move the various machine elements of each individual section,

a plurality of variable aperture valve means connected in fluid communication with said fluid actuators and each connected to control the velocity of movement of said fluid actuators of the glassware-forming machine,

control switches actuated in accordance with movement of said fluid actuators,

control means having inputs from said control switches and having outputs,

said control means having presettable means to establish preset times of travel of various ones of the machine elements and having comparison means to compare the preset time and the actual time of travel of various ones of the machine elements,

and said outputs of said control means connected to control the variable aperture of said valve means to control the velocity and time of actuation of various ones of the machine elements of each individual section.

4,007,029

FERTILIZER SOLUTION COMPRISING A TRACE ELEMENT IN LIQUID AMMONIA

Joseph R. Kenton, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 17, 1975, Ser. No. 569,332
Int. Cl.² C05F 11/00
U.S. Cl. 71—11 **28 Claims**

1. A method of making a liquid fertilizer which comprises adding to anhydrous ammonia at least one trace element-containing compound to provide an available element selected from the group consisting of B, Cu, Mn, Mg and Mo, and a solubilizing amount of a solubilizer wherein:

1. when the desired trace element is boron, the boron-containing compound is selected from the group consisting of boric acid and ammonium borate and said solubilizer is ammonium acetate;
2. when the desired trace element is copper, the copper-containing compound is selected from the group consisting of

a. cupric nitrate,
b. cupric acetate, and
c. cuprous chloride, cupric chloride, cuprous bromide and cupric bromide,

wherein when said copper source is (b) cupric acetate, said solubilizer is selected from the group consisting of ammonium nitrate, sodium acetate, ammonium acetate and magnesium acetate, and wherein when said copper source is (c) a cupric or cuprous chloride or bromide, said solubilizer is selected from the group consisting of ammonium nitrate and ammonium acetate;

3. when the desired trace element is manganese, the manganese-containing compound is selected from the group consisting of manganous acetate and manganous nitrate and said solubilizer is selected from the group consisting of ammonium acetate and ammonium nitrate;
4. when the desired trace element is magnesium, the magnesium-containing compound is selected from the group consisting of

a. magnesium acetate, and
b. magnesium formate and magnesium nitrate, wherein when said magnesium source is (b), said solubilizer is ammonium acetate;

5. and, when the desired trace element is molybdenum, the molybdenum-containing compound is selected from the group consisting of molybdenum trioxide and ammonium molybdate and said solubilizer is ammonium acetate and water.

4,007,030

PROCESS FOR THE SIMULTANEOUS MANUFACTURE OF PHOSPHORIC ACID OR THE SALTS THEREOF AND A COMPLEX MULTI-COMPONENT MINERAL FERTILIZER

Jerzy Schroeder, Wroclaw; Jerzy Synowiec, Gliwice; Tadeusz Zrubek, Krakow; Henryk Gorecki, Wroclaw; Zdzislaw Wolnicki, Warsaw, and Roman Hnatowicz, Krakow, all of Poland, assignors to Przedsiebiorstwo Projektowania I Dostaw Kompletnych Obiektov Przemyslowych "Chemadx", Krakow, Poland

Filed Mar. 2, 1976, Ser. No. 663,074
Claims priority, application Poland, Mar. 6, 1975, 178549
Int. Cl.² C05B 1/00, 11/08
U.S. Cl. 71—40 **4 Claims**

1. A process for the simultaneous manufacture of (a) phosphoric acid and (b) a multi-component mineral fertilizer of the NPK type comprising the steps of (1) decomposing crude phosphate rock with an aqueous solution containing ammonium sulfate and sulfuric acid in a molar ratio of about 0.7 to 1.0, whereby a first precipitate of phospho-gypsum is formed; (2) filtering off said first precipitate; (3) dividing the filtrate into two streams designated Liquor I and Liquor II; Liquor I comprising not more than 30 per cent by weight of the two streams; (4) adiabatically cooling Liquor I below 30° C; (5) adding a water miscible organic solvent to the cooled Liquor I below 30° C. in the volume ratio of from about 0.8 to 1.6 of solvent to Liquor I whereby a second precipitate comprising neutral ammonium sulfate and mineral impurities is formed; (6) filtering off said second precipitate to yield an organic solvent-aqueous solution filtrate containing phosphoric acid; (7) separating said organic solvent from said phosphoric acid by distillation; (8) treating Liquor II with potassium chloride, said second precipitate comprising ammonium sulfate, and gaseous ammonia to form an ammonized reaction mixture; and (9) drying and granulating said ammonized reaction mixture to form a multi-component fertilizer of the NPK type.

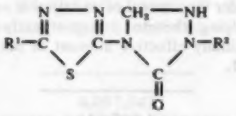
4,007,031

2-ALKYL-4-THIADIAZOLYL-1,2,4-TRIAZOLIDIN-3-ONES

John Krenzer, Oak Park, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Division of Ser. No. 455,697, March 28, 1974, Pat. No. 3,931,209. This application Sept. 18, 1975, Ser. No. 614,464
Int. Cl.² A01N 9/12
U.S. Cl. 71—90 **9 Claims**

1. A herbicidal composition comprising an inert carrier and, as an essential active ingredient, in a quantity toxic to weeds, a compound of the formula



wherein R^1 is selected from the group consisting of lower alkyl, lower alkenyl, lower chloroalkyl, trifluoromethyl, lower alkoxy, lower alkylthio, lower alkylsulfonyl, lower alkylsulfinyl, and cycloalkyl of from 3 to 7 carbon atoms optionally substituted with from 1 to 2 substituents selected from the group consisting of lower alkyl, lower alkoxy, chlorine, bromine, and fluorine; and R^2 is lower alkyl.

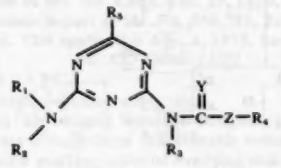
4,007,032

HERBICIDALLY ACTIVE TRIAZIN-DERIVATIVES

Dagmar Berrer, Riehen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed July 21, 1975, Ser. No. 597,608
Claims priority, application Switzerland, July 25, 1974, 10268/74
Int. Cl.² A01N 9/22; C07D 251/52, 251/66
U.S. Cl. 71—93 **9 Claims**

1. A compound of the formula I



(I)

wherein

R_1 represents hydrogen, C_1–C_6-alkyl, C_3–C_6-cycloalkyl, C_4–C_7-cycloalkylalkyl, C_2–C_6-alkoxyalkyl, C_2–C_6-cyanoalkyl, C_3–C_4-alkenyl or C_3–C_4-alkynyl,

R_2 represents hydrogen or C_1–C_6-alkyl,
R_3 represents hydrogen or C_1–C_6-alkyl,
R_4 represents C_1–C_6-alkyl, C_3–C_6-cycloalkyl, C_2–C_6-alkoxyalkyl, C_2–C_6-cyanoalkyl or C_1–C_6-halogenoalkyl,
R_5 represents methoxy, ethoxy, methylthio, ethylthio or azido (N_3), and
Y and Z each independently represent sulphur or oxygen.

4,007,033
HERBICIDAL SUBSTITUTED-HALOETHYL UREA

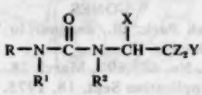
Malcolm Scott Singer, Richmond, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 389,093, Aug. 17, 1973, Pat. No. 3,903,154, which is a continuation-in-part of Ser. No. 385,521, Aug. 3, 1973, abandoned, which is a continuation-in-part of Ser. Nos. 124,422, March 16, 1971, abandoned, and Ser. No. 124,423, March 16, 1971, abandoned. This application May 29, 1975, Ser. No. 581,985

Int. Cl.² A01N 9/20; C07C 127/19

U.S. Cl. 71—111 **10 Claims**

1. A compound of the formula



wherein R is phenyl substituted with up to 2 fluorine, chlorine, bromine, trifluoromethyl, nitro, lower alkyl, or lower alkoxy; R^1 is hydrogen or alkyl of 1 to 4 carbon atoms, R^2 is alkyl of 1 to 4 carbon atoms; Z is chlorine or bromine, Y is hydrogen or Z, and X is carbalkoxyalkoxy of 2 to 6 carbon atoms.

6. A method for the control of undesirable vegetation which comprises applying thereto pre-emergently or post-emergently a herbicidally effective amount of the compound defined in claim 1.

4,007,034
METHOD FOR MAKING STEEL

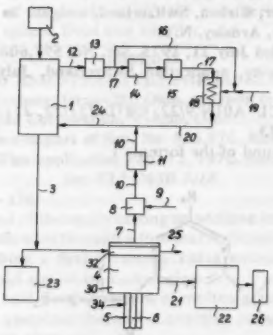
Jürgen Hartwig, Essen; Dieter Neuschütz, Langenfeld, and Dietrich Radke, Essen, all of Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed May 21, 1975, Ser. No. 579,738

Claims priority, application Germany, May 22, 1974, 2424932

Int. Cl.² C21C 5/00

U.S. Cl. 75—46 **14 Claims**



1. A process for producing steel from iron oxide-containing raw materials which comprises the steps of:
a. initially converting the raw materials, in a reduction furnace by direct reduction with a reducing gas, to a substantially metallized sponge iron;
b. separating the sponge iron formed in the reduction furnace from exhaust reduction gas which forms during the reduction in the reduction furnace and transporting the separated sponge iron into a metal melt of iron in a melting vessel;
c. melting and finally reducing the sponge iron in the metal melt with carbonaceous material which is introduced into the metal melt and with oxygen introduced into the metal melt via an oxygen-containing gas, with heat and strongly-heated carbon monoxide-containing exhaust gas being formed in the melting vessel due to the reaction of the oxygen with the carbonaceous material, said carbonaceous material and oxygen-containing gas being introduced into the metal melt below the surface of the metal melt in immediate proximity to each other;
d. reacting the entire strongly-heated carbon monoxide-containing exhaust gas from the melting vessel in a reactor by adding to said exhaust gas from the melting vessel (1) carbonaceous material and (2) water vapor and/or carbon dioxide to form a first reducing gas stream;
e. introducing the first reducing gas stream into the reduction furnace as reducing gas for the direct reduction of the iron oxide-containing raw materials;
f. conducting a portion of the exhaust gas formed in the direct reduction furnace through a gas processing system to form a second reducing gas stream; and
g. introducing the second reducing gas stream into the reduction furnace as reducing gas for the direct reduction of the iron oxide-containing raw materials.

4,007,035
METHOD OF USING AN EXPENDABLE TAP HOLE TUYERE IN OPEN HEARTH DECARBURIZATION

Robert W. Smith, Lower Makefield Township, Bucks County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 365,775, May 31, 1973, abandoned. This application Jan. 27, 1975, Ser. No. 544,162

Int. Cl.² C21C 5/48

U.S. Cl. 75—60 **13 Claims**

3. A process in accordance with claim 2, wherein the refining fluid comprises a stream of oxygen and a protective jacket fluid selected from the group consisting of hydrocarbon, inert gas, steam, carbon dioxide, and non-explosive mixtures thereof is simultaneously injected enveloping said stream of oxygen.

4,007,036
METHOD OF SMELTING ALUMINUM

Hans-Joachim Gottschol, and Karl-Josef Gottschol, both of Hagen-Haspe, Germany, assignors to Dr. Ing. Gottschol Metallurgie Kommanditgesellschaft, Berlin, Germany

Filed Nov. 11, 1974, Ser. No. 522,757

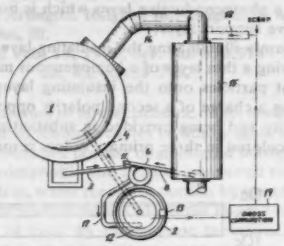
Claims priority, application Germany, Nov. 9, 1973, 2355951

Int. Cl.² C22B 21/00

U.S. Cl. 75—68 R **6 Claims**

1. A method of smelting pieces of a nonferrous metal, said method comprising the steps of:
a. drawing preheated pieces of said nonferrous metal by suction into a stream of said nonferrous metal,
b. turbulencing the resulting mixture;

c. introducing the turbulenced mixture into a satellite furnace, and



d. heating said mixture in said satellite furnace to form a molten body of said nonferrous metal and a layer of dross on said body.

4,007,037

COMPOSITION AND METHOD FOR CHEMICALLY ETCHING COPPER ELEMENTS

Robert M. Lukes, Louisville, and Jeffrey C. Sellins, Douglass Hills, both of Ky., assignors to General Electric Company, Louisville, Ky.

Filed July 9, 1975, Ser. No. 594,312
Int. Cl.² C22B *15/12*
U.S. Cl. 75—117 **25 Claims**

1. A copper etching process, comprising:

contacting a copper element to be etched with an aqueous etching solution, said copper etching solution comprising a cupric compound and a complexing agent, said cupric compound being water soluble and substantially free of anions capable of forming a stable complex ion with cuprous ions in said solution and said complexing agent being a material capable of forming a stable complex ion with cuprous ions and being substantially free of material capable of forming a complex ion with cupric ion; and

maintaining the copper element in contact with said etching solution under etching conditions for a time sufficient to etch said copper element and form a cuprous complex ion.

14. A process, as set forth in claim 1, including physically treating the resultant copper etching solution having said cuprous complex and converting the cuprous complex to said cupric compound and said complexing agent; thereafter separating at least one of copper metal, cuprous oxide, or a mixture thereof, from the resultant solution; and recovering the resultant cupric compound and complexing agent.

18. A process, as set forth in claim 14, including etching the copper element in an etching tank and passing the recovered resultant cupric compound and complexing agent to said etching tank.

4,007,038

PITTING RESISTANT STAINLESS STEEL ALLOY HAVING IMPROVED HOT-WORKING CHARACTERISTICS

Harry E. Deverell, Natrona Heights, Pa., assignor to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Filed Apr. 25, 1975, Ser. No. 571,460
Int. Cl.² C22C *38/44*
U.S. Cl. 75—122 **4 Claims**

1. An austenitic stainless steel consisting essentially of about 20% to 40% nickel, 14% to 21% chromium, about 6% to 12% molybdenum, up to 0.2% carbon, up to 2% manganese, 0.010% to 0.080% cerium, 0.005% to 0.015% calcium, up to about 0.006% sulfur, and the remainder essentially all iron.

4,007,039

COPPER BASE ALLOYS WITH HIGH STRENGTH AND HIGH ELECTRICAL CONDUCTIVITY

Stanley Shapiro, New Haven; Eugene Shapiro, Hamden; Brian Mravic, North Haven, and W. Gary Watson, Cheshire, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Mar. 17, 1975, Ser. No. 559,307
Int. Cl.² C22C *9/00*
U.S. Cl. 75—153 **4 Claims**

1. A process for producing a high conductivity and high strength copper base alloy comprising the steps of preparing a molten alloy consisting essentially of 0.8 to 5% titanium, 1.2 to 5% antimony, balance copper, wherein the titanium and antimony are present at an atomic ratio of not more than 10% above 5 atoms of titanium per 3 atoms of antimony, casting said alloy, then mechanically reducing the cross-section of the cast alloy in successive steps with intervening thermal treatments, and subjecting the alloy to an aging treatment at 250° to 500° C for ½ to 24 hours.

4,007,040

HARD COPPER FREE DENTAL GOLD ALLOYS

Rudolf Kropp, Pforzheim-Wurm, Germany, assignor to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany

Filed Jan. 27, 1976, Ser. No. 652,858
Claims priority, application Germany, Mar. 5, 1975, 2509476
Int. Cl.² C22C *5/02*
U.S. Cl. 75—165 **9 Claims**

1. A hard copper free gold alloy suitable for dental purposes consisting essentially of (a) 61 to 85 weight of gold, 8 to 15 weight % platinum, 0 to 4 weight % palladium, 5 to 15 weight % silver and 2 to 5 weight % zinc or (b) an alloy as defined in (a) with 0.05 to 0.1 weight % of the platinum replaced by iridium.

4,007,041

ELECTROPHOTOGRAPHIC PRINTING METHOD

Che Chung Chow, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 10, 1975, Ser. No. 556,841
Int. Cl.² G03G *13/14*
U.S. Cl. 96—1 LY **5 Claims**

1. An offset printing method is which an image is electrophotographically formed on a drum, developed with an ink and transferred to a receiver sheet by means of an intermediate blanket roller, comprising coating the blanket roller with an ink releasable material such that substantially all the inked image is transferred from the master to the receiver sheet so as to obviate the requirement of cleaning the blanket roller after each print is made from a new image.

4,007,042

MIGRATION IMAGING METHOD

David A. Buckley; Roger N. Ciccarelli, both of Rochester, and Frank G. Belli, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 6,862, Jan. 29, 1970, which is a continuation-in-part of Ser. No. 566,791, July 21, 1966, abandoned. This application Apr. 3, 1975, Ser. No. 564,951
Int. Cl.² G03G *13/22*
U.S. Cl. 96—1 PS **17 Claims**

9. An imaging method comprising:

providing an imaging member comprising a supporting substrate a single layer of softenable material containing migration marking material overlying said substrate, said softenable material containing as the entire upper portion thereof a surface skin having a chemical composition different from the bulk of the softenable material and having a thickness not greater than about 0.3 micron and a viscosity during imaging of said member greater than

that of the bulk of said softenable layer of softenable material, said softenable material capable of having its resistance to migration of migration marking material dispersed sufficiently to allow migration of migration marking material in depth in said softenable material toward said substrate;

applying an electrical imagewise migration force to the migration marking material,

developing said member by decreasing the resistance of migration of migration marking material in depth in the softenable material at least sufficient to allow migration of migration material whereby migration marking material migrates at least in depth in said softenable material toward the substrate in imagewise configuration.

4,007,043

PHOTOCONDUCTIVE ELEMENTS WITH COPOLYMER CHARGE TRANSPORT LAYERS

Milan Stolka, Fairport, and Sam R. Turner, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

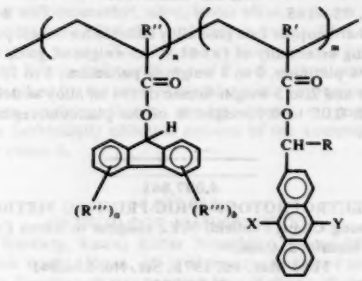
Filed July 16, 1975, Ser. No. 596,531

Int. Cl.² G03G *5/04, 5/06*

U.S. Cl. 96—1 PC **10 Claims**

6. An electrophotographic imaging process comprising:

a. providing an electrophotographic imaging member having a photoconductive insulating layer containing a copolymer of the formula:



wherein

R is hydrogen or methyl;

R′ is hydrogen or methyl;

R″ is alkyl of 1 – 5 carbon atoms;

R‴ is selected from the group consisting of $-NO_2$, halogen, —CN and $-CF_3$;

X and Y are independently selected from the group consisting of hydrogen, chlorine, bromine, alkyl of 1 – 4 carbon atoms and phenyl;

a and *b* can range from 0 – 4; and

n can range from about 5 to about 95 percent of the total number of structural units of the copolymer; and

m can range from about 5 to about 95 percent of the total number of structural units of the copolymer; and

b. forming an electrostatic latent image on said member.

4,007,044

COLOR ELECTROPHOTOGRAPHIC PROCESS

Tsuyoshi Shiga, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Nov. 14, 1974, Ser. No. 525,421

Claims priority, application Japan, Dec. 11, 1973, 48-139342; Dec. 14, 1973, 48-140899

Int. Cl.² G03G *13/22*

U.S. Cl. 96—1.2 **5 Claims**

1. A color electrophotography process, comprising the steps of:

a. applying an electrostatic charge to a photoconductive member having a protective transparent insulating layer formed on a surface thereof to create a charge of a first polarity at the surface, the insulatig layer being bonded onto a photoconductive layer which is bonded to a conductive support layer;

b. uniformly illuminating the insulating layer;

c. applying a thin layer of a homogeneous mixture of translucent particles onto the insulating layer, the particles having a charge of a second polarity opposite to the first polarity and being provided in substantially equal numbers colored in three primary colors respectively;

d. applying a colored light image onto the insulating layer through the particles, the particles absorbing light of their complementary colors respectively;

e. applying a force to the insulating layer to remove particles from areas of the insulating layer where the electrostatic force between the photoconductive member and the particles has been reduced below a predetermined value during step *d*;

f. transferring the particles remaining on the insulating layer to the surface of a recording medium after performing step *e*.

4,007,045

ELECTROPHOTOGRAPHIC COLOR PROCESS AND ELECTROPHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL FOR USE IN THE ELECTROPHOTOGRAPHIC COLOR PROCESS

Eisuke Ishida, Nara; Yuji Takashima, Osaka; Hisanori Nishiguchi, Neyagawa, and Fujio Oda, Ashiya, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Mar. 14, 1975, Ser. No. 558,560

Claims priority, application Japan, Mar. 27, 1974, 49-34990; Apr. 9, 1974, 49-40536

Int. Cl.² G03G *5/12, 5/04*

U.S. Cl. 96—1.5 **14 Claims**

1. An electrophotographic process for color reproduction comprising the steps of:

a. charging an electrophotographic light-sensitive material by corona discharge, said material having at least two kinds of color-producing photoconductive particles disposed at random on an electroconductive support, said particles consisting essentially of a photoconductive particle, a sensitizer and a leuco dye,

b. exposing said charged material to light,

c. developing said material by a toner containing acid substance, and

d. producing color in the leuco dye by the interaction of the leuco dye with the acid substance by heating or by dissolving the leuco dye or the acid substance with a solvent.

10. An electrophotographic light-sensitive material comprising an electroconductive support and a photoconductive layer having three kinds of color-producing photoconductive particles disposed at random on the support, said color-producing photoconductive particles consisting of (i) a color-producing photoconductive particle comprising a photoconductive particle, a sensitizer absorbing blue-violet light and a leuco dye producing yellow color, (ii) a color-producing photoconductive particle comprising a photoconductive particle, a sensitizer absorbing green light and a leuco dye producing magenta color and (iii) a color-producing photoconductive particle comprising a photoconductive particle, a sensitizer absorbing red light and a leuco dye producing cyan color.

4,007,046
METHOD OF TREATMENT OF OFFSET MASTERS PRIOR TO CONVERSION

George M. Ort, Arlington Heights, Ill., assignor to A. B. Dick Company, Niles, Ill.

Filed Feb. 19, 1975, Ser. No. 550,974
Int. Cl.² G03F 7/02
U.S. Cl. 96—33 6 Claims

1. In the preparation of an electrostatic offset master for use in the production of multiple copies by lithographic technique in which the non-imaged portion of an imaged master is water repellent and hydrophobic and must be converted to a hydrophilic, ink repellent, water receptive portion by treatment with a conversion composition before use of the imaged master for the production of copy by lithographic technique, the improvement which renders possible the storage of imaged masters for future use in the production of multiple copies without deterioration of copy quality comprising the step of wetting the imaged surface of the master with an organic solvent having a KB value below 50 immediately prior to conversion whereby residual solvent remains on the imaged areas as a barrier against the conversion composition to preclude over-conversion and subsequent blinding of the imaged areas with the deterioration of copy quality during subsequent use of the treated master in the production of copies.

4,007,047
MODIFIED PROCESSING OF POSITIVE PHOTORESISTS

Leon H. Kaplan, Yorktown Heights, and Steven M. Zimmerman, Wappingers Falls, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 476,831, June 6, 1974, abandoned.
This application Dec. 10, 1975, Ser. No. 639,536
Int. Cl.² G03F 7/08; G03C 5/00
U.S. Cl. 96—36 15 Claims

1. A photoresist process comprising the steps of:
a. providing on a substrate a layer of a light sensitive resist material consisting essentially of an alkali soluble phenol-formaldehyde resin and a naphthoquinone-(1,2)-diazide sulfonic acid ester sensitizer;
b. exposing said layer imagewise to radiation with sufficient energy to convert a majority of said diazo ketone to a alkali soluble form in the exposed portion of said layer;
c. treating said layer, following said exposure, with a mildly acidic aqueous solution;
d. exposing the entire layer with actinic radiation; and then
e. developing a negative relief image of resist on said substrate by removing the initially unexposed portions of said layer with an alkaline developer solution.

4,007,048
DARK RED TRANSPARENT REFRACTORY GLASS

Werner Sack, Mainz, and Herwig Scheidler, Finthen, both of Germany, assignors to Jenaer Glaswerk Schott & Gen., Mainz, Germany

Filed June 17, 1975, Ser. No. 587,675
Claims priority, application Germany, June 20, 1974, 2429563
Int. Cl.² C03B 32/00; C03C 3/22
U.S. Cl. 106—39.7 15 Claims

1. Dark red, transparent glass ceramic, particularly for the manufacture of articles which can be locally heated, said glass ceramic having a "heat stress factor" R >1000, a crystal phase content being at least 30% and not more than 50% by weight, and a infrared transmission 13% in a layer of 4.5 mm. in thickness in the wave length range of from 1100 to 2700 nm. and formed from a basic glass consisting essentially of in percent by weight, calculated on an oxide basis:

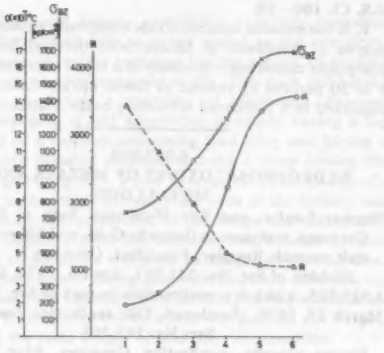
SiO_2	64.00 ± 0.30,
Al_2O_3	21.30 ± 0.20,
Li_2O	3.50 ± 0.15,

-continued

Na_2O	0.60 ± 0.15,
K_2O	0.50 ± 0.10,
BaO	2.50 ± 0.50,
CaO	0.20 ± 0.20,
MgO	0.10 ± 0.10,
ZnO	1.50 ± 0.50,
TiO_2	2.30 ± 0.10,
ZrO_2	1.60 ± 0.10,
MnO_2	0.65 ± 0.15,
Fe_2O_3	0.23 ± 0.03,
CoO	0.37 ± 0.05,
NiO	0.06 ± 0.02, and
Sb_2O_3	0.85 ± 0.15,

said basic glass having the following characteristics:

$\alpha \times 10^7$ (20 to 300° C)° C	= 43 ± 1
Tg (° C); η ca. $10^{12.3}$ P	= 680 ± 5
V_A (° C); $\eta = 10^4$ P	= 1290 ± 10
Density (g/cc.)	= 2.49 ± 0.05
position of the DTA-Peak$_{max}$ in ° C at a heating rate of 6 to 6.5° C/min	= 840 ± 5



that transparent glass ceramic produced from that basic glass by at least one heat treating cycle consisting essentially of:
a. heating the basic glass at a temperature up to 900° C for a sufficient time to obtain that crystalline phase content of at least 30% and not more than 50% by weight and to obtain a heat stress factor R above 1000; and
b. cooling the heated glass at a rate of about 1° to 7° C/min within a temperature range of about 900° to 750° C and of about 1 to 200° C/min within a temperature range of 750° C to room temperature;
said crystalline phase content consisting essentially of a member selected from the group consisting of h-quartz solid solutions, h-spodumene, and mixtures thereof, dependent on the number of heat treating cycles employed.

10. A process for the manufacture of a glass ceramic comprising the steps of:
a. heating a basic glass at 800°–900° C for a sufficient time to obtain said crystalline phase content of at least 30% and not more than 50% by weight; and
b. cooling the heated glass at a rate of about 1° to 7° C/min within a temperature range of about 900° to 750° C and of about 1° to 200° C/min within a temperature range of 750° C to room temperature;
said basic glass consisting essentially of in percent by weight calculated on an oxide basis:

SiO_2	64.00 ± 0.30,
Al_2O_3	21.30 ± 0.20,
Li_2O	3.50 ± 0.15,

-continued

Na_2O	0.60 ± 0.15,
K_2O	0.50 ± 0.10,
BaO	2.50 ± 0.50,
CaO	0.20 ± 0.20,
MgO	0.10 ± 0.10,
ZnO	1.50 ± 0.50,
TiO_2	2.30 ± 0.10,
ZrO_2	1.60 ± 0.10,
MnO_2	0.65 ± 0.15,
Fe_2O_3	0.23 ± 0.03,
CoO	0.37 ± 0.05,
NiO	0.06 ± 0.02, and
Sb_2O_3	0.85 ± 0.15.

4,007,049

THERMAL SHOCK RESISTANT CERAMIC COMPOSITE

Ronald C. Rossi, and Robert D. Carnahan, both of Torrance, Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 6, 1968, Ser. No. 750,679

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² C04B *35/04*

U.S. Cl. 106—58 3 Claims

1. A hot-pressed ceramic oxide composite possessing a high degree of resistance to failure from thermal fracture, said composite consisting essentially of a blend composed of about 5 to 30 percent by volume of boron nitride flakes uniformly dispersed in a powdered refractory oxide matrix.

4,007,050

HYDROPHOBIC OXIDES OF METALS AND FOR METALLOIDS

Siegmar Laufer, and Roy Waldemar, both of Rheinfelden, Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany

Division of Ser. No. 241,761, April 6, 1972, Pat. No. 3,920,865, which is a continuation-in-part of Ser. No. 23,330, March 27, 1970, abandoned. This application Jan. 23, 1975, Ser. No. 543,368

Claims priority, application Germany, Mar. 29, 1969, 1916360

Int. Cl.² C09C *3/12*

U.S. Cl. 106—308 Q 13 Claims

1. An oxidic product having hydrophobic charcteristics, comprising oxide particles including SiO_2 particles having surfaces which are substantially free of silanol groups bound to each other by hydrogen bridges; and at least one organosilicon compound chemically bonded to said surfaces so as to impart hydrophobic properties to said particles, said compound being bonded to each of the respective surfaces at locations corresponding to those at which isolated silanol groups were present and with which said compound reacted chemically to become bonded to said surfaces.

4,007,051

COMPOSITION AND PREPARATION OF A DRY PREDISPERSED COATED PIGMENT

Oscar J. Gombar, Princeton, and James Howard, Somerset, both of N.J., assignors to Cities Service Company, Tulsa, Okla.

Continuation-in-part of Ser. No. 554,365, March 3, 1975, abandoned. This application Feb. 9, 1976, Ser. No. 656,567

Int. Cl.² C09C *3/08*

U.S. Cl. 106—308 Q 8 Claims

1. A dry, predispersed, coated pigment composition comprising:

a. a majority, varying from about 85 to 99.5 wt. %, of an organic or inorganic pigment, and

b. a minority, varying from about 0.5 to 15 wt.%, of a natural hydrocarbon fossil resin, the wt.percents being based on the weight of the finished pigment composition.

4,007,052

PREPARATION OF ADJUVANT-FREE FRUCTOSE TABLETS

Helmut Heinemann, Heidelberg, and Werner Rothe, Hockenheim, both of Germany, assignors to Boehringer Mannheim G.m.b.H., Mannheim, Germany

Filed Aug. 1, 1975, Ser. No. 601,571

Claims priority, application Germany, Aug. 23, 1974, 2440383

Int. Cl.² B29C *1/04*; C13K *11/00*

U.S. Cl. 127—30 10 Claims

1. The method of preparing adjuvant-free tablets from a tableting mass having a tendency to stick, comprising alternately in the same mold forming tablets from said tableting mass and from an adjuvant mass containing an easily tableted substance, a lubricant and a mold parting agent.

4,007,053

METHOD AND APPARATUS FOR SCRUBBING THE ENDS AND SIDES OF A MOTOR VEHICLE

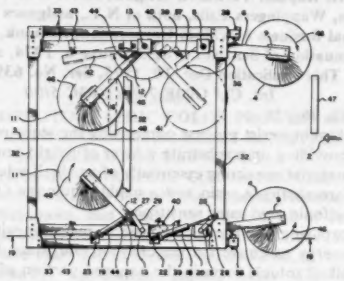
James H. Gray, Phoenix, Ariz., assignor to Cyprus Specialty Steel, Phoenix, Ariz.

Continuation of Ser. No. 405,329, Oct. 11, 1973, Pat. No. 3,926,663. This application Sept. 8, 1975, Ser. No. 611,279

The portion of the term of this patent subsequent to Dec. 16, 1992, has been disclaimed.

Int. Cl.² B08B *1/02*

U.S. Cl. 134—6 7 Claims



1. A method for scrubbing the front, rear and side surfaces of a vehicle as it moves relative to a washing installation, said installation having first and second pairs of independently pivoted brushes arranged so that the brushes of each pair move substantially simultaneously, and in substantially mirrored relationship, one with the other, said method including the sequentially initiated steps of:

a. engaging each side surface of said vehicle with one brush in said first pair of brushes;

b. transposing each brush in said first pair of brushes along the corresponding side surface of said vehicle from the front surface of said vehicle to the rear surface of said vehicle;

c. engaging the front surface of said vehicle with said second pair of brushes;

d. transposing each brush in said second pair of brushes across the front surface of said vehicle from the center of said vehicle to the side of said vehicle;

e. engaging each side surface of said vehicle with one brush in said second pair of brushes;

f. transposing each brush in said second pair of brushes along the corresponding side surface of said vehicle from the front surface of said vehicle to the rear surface of said vehicle;

g. engaging the rear surface of said vehicle with said first pair of brushes;

h. transposing each brush in said first pair of brushes across the rear surface of said vehicle from one side of the vehicle to at least the center of said vehicle;

whereby the front, rear and side surfaces of said vehicle are subjected to brushing while said vehicle only once passes said washing installation.

4,007,054

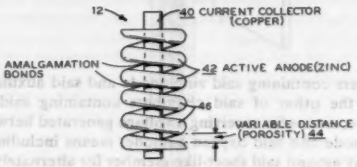
ELECTRIC CELL WITH ZINC COIL ANODE AND METHOD OF MAKING IT

Nikola Marincic, Winchester, Mass.; Ronald Merz, Cleveland, Tenn., and Robert H. Kelsey, Acton, Mass., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Continuation of Ser. No. 204,062, Dec. 2, 1971, abandoned. This application Jan. 21, 1976, Ser. No. 651,377

Int. Cl.² H01M 35/04

U.S. Cl. 429—206 7 Claims



1. An alkaline electric cell comprising an anode embodying a helically wound zinc filamentary element surrounding and supported on a linear, elongated conductor of high electrical conductivity, said element being bonded to said conductor by amalgamation of mercury.

4,007,055

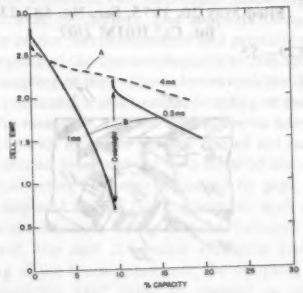
PREPARATION OF STOICHIOMETRIC TITANIUM DISULFIDE

M. Stanley Whittingham, Fanwood, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed May 9, 1975, Ser. No. 575,994

Int. Cl.² H01M 4/36

U.S. Cl. 423—565 8 Claims



1. A process for producing stoichiometric titanium disulfide and having a small aspect ratio which comprises heating particulate titanium to a reaction temperature of between about 475° C. and about 600° C. and contacting the heated titanium with an atmosphere having a sulfur partial pressure substantially equal to the equilibrium sulfur partial pressure over titanium disulfide at the reaction temperature to form titanium disulfide, said titanium and sulfur being used in substantially stoichiometric amounts, and holding the heated titanium at the reaction temperature to homogenize the titanium disulfide.

4,007,056

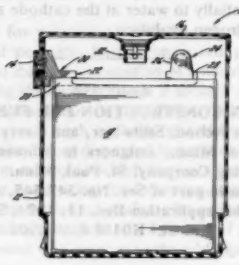
LEAD BASE CADMIUM-TIN ALLOY USEFUL FOR FORMING BATTERY COMPONENTS

Purushothama Rao, Burnsville, and George W. Mao, St. Paul, both of Minn., assignors to Gould Inc., Rolling Meadows, Ill.

Continuation of Ser. No. 403,178, Oct. 3, 1973, abandoned. This application May 23, 1975, Ser. No. 580,194

Int. Cl.² H01M 39/00

U.S. Cl. 429—222 7 Claims



1. In a lead-acid battery comprising a battery container having a plurality of cells, a cover sealed to the container, venting means providing passages for the escape of evolved gas and an electrolyte contained in the cells, each cell having components including a plurality of electrodes disposed therein comprising a grid supporting structure having a lug and formed of a calcium containing lead alloy and having a layer of active material attached thereto, a strap joining the lugs of the grids together, a pair of terminal posts electrically connected to the straps in two of the cells of the battery and intercell connectors connected to the straps and electrically connecting adjacent cells, the improvement wherein at least one of said components comprise an alloy composition consisting of a lead matrix having dispersed therein a cadmium-tin eutectic phase, the cadmium and tin being each present in an amount of from about 0.4 to about 1.4 percent by weight, based upon the total weight of said alloy composition.

4,007,057

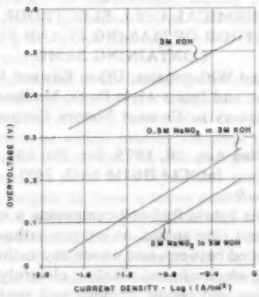
CELL COMPRISING AN ALKALI METAL AND AQUEOUS ELECTROLYTE

Ernest Lucius Littauer, Los Altos Hills; Roger Paul Hollandsworth, Mountain View, and Keh Chi Tsai, Saratoga, all of Calif., assignors to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed Dec. 29, 1975, Ser. No. 645,199

Int. Cl.² H01M 6/04

U.S. Cl. 429—57 4 Claims



1. An electrochemical cell consisting essentially of an alkali metal anode highly reactive with water and spaced from a

cathode by an electrically insulating film formed on said anode in the presence of water, an aqueous alkaline hydroxide electrolyte in which said anode and cathode are immersed, said electrolyte permitting at the anode electrochemical dissolution of reactive metal to aqueous reactive metal ions and formation of an aqueous salt to a solid salt in the form of a porous film on said anode, and at least one soluble inorganic ion selected from the group of ions consisting of nitrite, hypochlorite, chlorate, bromate, dinitrogen trioxide and sulfite ions in said aqueous alkaline hydroxide electrolyte which is reduced preferentially to water at the cathode and substantially eliminates hydrogen evolution.

4,007,058

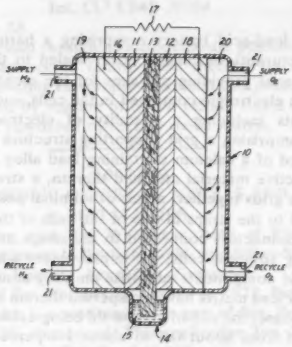
MATRIX CONSTRUCTION FOR FUEL CELLS

Alfred Dwayne Nelson, Stillwater, and Larry E. Espelien, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 347,545, April 4, 1973, abandoned. This application Dec. 11, 1974, Ser. No. 531,718

Int. Cl.² H01M *8/00, 2/00*

U.S. Cl. 429—34 **4 Claims**



1. In fuel cell comprising a case, positive and negative porous electrodes inserted within the case and enclosing an inner space, electrolyte within said inner space, means for introducing an oxidant gas through one porous electrode and a fuel through the other, the improvement comprising having the inner space occupied by a thin porous fibrous separator matrix consisting essentially of a self-supporting compressible porous fibrous mat of uniformly distributed but randomly dispersed and entangled microfibers of a high molecular weight thermoplastic polyarylsulfone ether polymer.

4,007,059

ELECTROCHEMICAL CELL ELECTRODE SEPARATOR AND METHOD OF MAKING IT AND FUEL CELL CONTAINING SAME

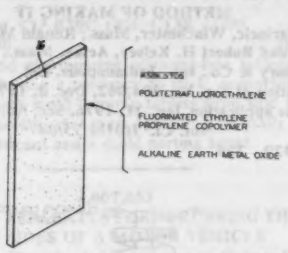
Romeo Richard Witherspoon, Utica; Edward Marion Domanski, Warren, and James Alvin Davis, Madison Heights, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 20, 1975, Ser. No. 605,985

Int. Cl.² H01M *8/02, 2/00*

U.S. Cl. 429—9 **6 Claims**

5. A zinc-air hybrid fuel cell comprising a container and in said container a zinc anode, an oxygen cathode, an auxiliary electrode spaced between said anode and cathode and serving as a charging electrode, an alkaline electrolyte for ionically communicating said anode, cathode and auxiliary electrode, an ion permeable sheet-like member between said auxiliary electrode and said oxygen anode, said sheet-like member including about 10 to 15% by weight of an alkaline earth metal oxide, about 40 to 60% by weight asbestos fibers of a length less than about 5 microns, about 20 to 35% by weight unsintered polytetrafluoroethylene fibers having a length less than about 40 microns, and about 5 to 15% by weight of a fluorinated ethylene-propylene copolymer bonding at least said fibers together to form a sheet-like body having a pore size as formed of less than about 0.20 microns, said sheet-like member separating said container into two chambers, one of said



chambers containing said zinc anode and said auxiliary electrode, the other of said chambers containing said oxygen cathode, means for receiving a voltage generated between said zinc anode and said oxygen cathode, means including a passageway around said sheet-like member for alternately removing electrolyte from said other chamber and returning it, and means for applying a charging voltage across said anode and auxiliary electrode while electrolyte has been removed from said other chamber.

4,007,060

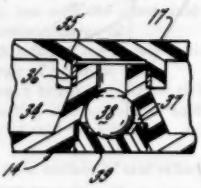
PLASTIC CASE FOR FLAT RECHARGEABLE CELL

Dennis Dean Sorensen, Bloomington, Minn.; Richard Allan Erickson, New Richmond, Wis., and Harry Ellwood Iepson, Lino Lakes, Minn., assignors to Gould Inc., Rolling Meadows, Ill.

Filed May 30, 1975, Ser. No. 582,234

Int. Cl.² H01M *2/02*

U.S. Cl. 429—53 **9 Claims**



1. A flat sealed case for a secondary cell comprising, in combination:

a shallow, substantially flat base having a low peripheral wall;

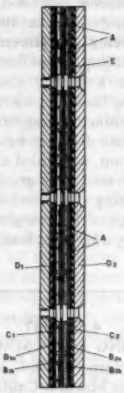
a thin substantially flat cover having peripheral edge means bonded to said peripheral wall; and,

opposing means on said cover and base located internally thereof with respect to said peripheral edge means and said peripheral wall and bonded to one another for restraining said flat cover and base from bulging upon a build-up of internal pressure within said sealed cell case.

4,007,061
THERMOELECTRIC HEAT PUMP

Georges Le Couturier, 20, cours d'Herbouville, 69004 Lyon, France

Filed June 5, 1975, Ser. No. 584,092
Claims priority, application France, June 5, 1974, 74.19360; Feb. 13, 1975, 75.04446
Int. Cl.² H01L *35/02, 35/04*
U.S. Cl. 136—221 8 Claims



1. A heat pump comprising a set of thermoelements that are substantially of the same thickness and at least two flat radiant elements to provide diffusion or absorption of heat, the said pump being made in sandwich form comprising, in addition to the said radiant elements, two electrically insulating supports that are good heat conductors, said supports being disposed on either side of the thermoelements and providing both the electrical coupling of the thermoelements to one another and the thermal coupling of the radiant elements to the thermoelements, while producing a mechanical coupling of the arrangement of all the elements, each of said supports having a first face contacting with its entire surface one of the radiant elements and a second face covered by a layer of discontinuous electrically conducting elements separated by gaps, such elements being disposed on the two supports in such a manner that, the thermoelements being located between them in contact thereof, the said conductor elements produce the serial coupling of the thermoelements, the coupling points of a first thermoelectric kind being all situated on one of the layers and the coupling points of the other thermoelectric kind being all situated on the other of said layers and the two end conductor elements of one of the layers being provided with means for coupling to the opposite poles of a source of continuous electric current, and a plurality of locking members passing through the said sandwich in the said gaps, said locking members exerting a substantially uniform pressure at the level of the contacts between the thermoelements and the said discontinuous conductor elements and at least one thin sheet of good thermal conductor elastic material disposed between one of the radiant elements and the face of the support which faces the radiant elements.

4,007,062
REINFORCED COMPOSITE ALLOYS, PROCESS AND APPARATUS FOR THE PRODUCTION THEREOF

Raymond Henri Sifferlen, Veurey-Voroize, France, assignor to Societe Industrielle de Combustible Nucleaire, Annecy, France

Division of Ser. No. 368,434, June 8, 1973, Pat. No. 3,858,640.
This application Sept. 27, 1974, Ser. No. 510,000
Claims priority, application France, June 9, 1972, 72.20864
Int. Cl.² C22F *1/04;* C22C *32/00*
U.S. Cl. 148—2 5 Claims

1. A process for preparing a reinforced composite alloy without residual porosity, having improved properties and particularly good ductility, consisting of a matrix of very pure aluminium having dispersed therein 3 to 20% by weight of a refractory material addition in grain form, said addition being insoluble in aluminum both in the solid and liquid states, and said addition grains being dispersed homogeneously throughout the aluminum matrix to which they are bonded individually, said process comprising the following steps:

a. forming a dispersion of grains of a refractory material using a fluidized suspension in a stream of preheated gas, which is neutral with respect to the addition grains and to the aluminum;
b. desorbing moisture, oxygen and nitrogen from said grains to superficially activate said grains;
c. introducing said dispersion into molten aluminum with energetic stirring, at a temperature selected in the range from 850° to 1300° C to form a homogeneous composite alloy;
d. degasing the homogeneous composite alloy;
e. casting and solidifying the composite alloy;
f. subjecting the solidified composite alloy; to at least one hot-rolling step at about 400° C; and
g. subjecting the rolled composite alloy to at least one annealing step at about 350° C.

4,007,063
HEAT TREATING METHOD FOR METAL FILM RESISTOR

Toshitaka Yasuda, No. 2211-6, Yamada-Shimo, Suita, Osaka; Hiroshi Takahama, No. 4, 4-Chome, Shuntoku-cho, Higashi-Osaka, Osaka; Hachiro Hamaguchi, No. 269, 3-chome, Gakuen-Daiwa-cho, Nara, Nara; Sajiro Shimizu, No. 81, Sumiyoshi-cho, Sumiyoshi, Osaka, Osaka, and Kenji Mori, No. 12-25, 1-chome, Hishiya-Higashi, Higashi-Osaka, Osaka, all of Japan

Filed June 12, 1975, Ser. No. 586,284
Claims priority, application Japan, Aug. 21, 1974, 49-96385
Int. Cl.² H01C *17/06*
U.S. Cl. 148—6.3 24 Claims

1. A method for forming a metal film type resistor by heat-treating a metal film having a non-crystalline structure and having adsorbed foreign elements giving nonmetallic resistance characteristics to the film and having a temperature coefficient of resistance which is lower than the desired coefficient for forming the metal film type resistor therefrom, said method comprising:

heating the metal film in an oxidizing atmosphere at a temperature between a first critical temperature and a second critical temperature, said first critical temperature being a temperature at which heating removes said adsorbed foreign elements from the film and changes the film from a non-crystalline state to a crystalline state so that the metal film begins to have a more positive temperature coefficient of resistance, and said second critical temperature being a temperature at which the tendency of the temperature coefficient of resistance to become more negative due to oxidation becomes larger than the tendency for the coefficient to become more positive, said heating being continued until the temperature coefficient of resistance of the film changes the desired amount in the positive direction;

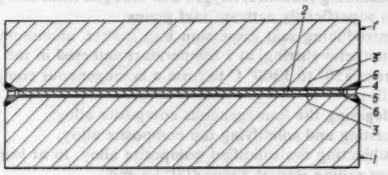
at a temperature above a third critical temperature, which is a temperature at which oxidation of the film reaches a saturation point so that the tendency of the temperature coefficient of resistance to become more negative due to oxidation becomes smaller than the tendency of the coefficient to become more positive due to the temperature rise, said whereby the temperature coefficient of resistance is adjusted to a desired value and a protective oxide film is formed on the film surface and the resistance and the temperature coefficient of resistance are stabilized.

4,007,064

PROCESS OF PRODUCING SURFACE-DECARBURIZED STEEL SHEETS OR PLATES

Giswalt Veitl, Linz, Austria, assignor to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Sept. 24, 1975, Ser. No. 616,380
Claims priority, application Austria, Oct. 23, 1974, 8503/74
Int. Cl.² C21D *1/74, 3/04*
U.S. Cl. 148—12.1 **6 Claims**



1. A process for producing surface-decarburized steel sheets or plates, comprising the steps of

forming a package by bringing together

at least one sheet layer of a high alloy chromium steel consisting essentially of from between 0.02 and 0.15% C, 0.15 and 2% Mn, 0 and 2% Si, 5 and 30% Cr, 0 and 5% Ni, and from between 0 and 5% of an element selected from the group consisting of Mo, W and V, from between 0 and 2% of an element selected from the group consisting of Nb, Ta, Ti or Zr, and from between 0 and 1% rare earths, balance iron and usual impurities, to serve as decarburizing agent, and

at least one steel sheet or plate,

fixing the package by applying edge welding seams,

heating the package to rolling temperature,

subsequently rolling the package,

subsequently annealing the package at a temperature within the carbide forming range, and thereupon

separating the package.

4,007,065

HYSTERESIS ALLOY

Ralph M. Handren, Crystal Lake, Ill., and John P. McKay, Walworth, Wis., assignors to Arnold Engineering Company, Marengo, Ill.

Filed Feb. 28, 1975, Ser. No. 554,350
Int. Cl.² H01F *1/04*
U.S. Cl. 148—31.57 **2 Claims**

1. A precipitation-hardened magnetic alloy, the components of which were heated to a temperature of at least about 1650° C to form a melt which is cast, heat treated and then aged to produce uniform magnetic properties throughout the casting and having a typical maximum energy product of BH max. of at least 0.85 MGO, and having a Rockwell hardness on the order of about C46, said alloy consisting essentially of about 14 to 17% nickel, 7 to 11% aluminum, 0.5 to 10% cobalt, 0.1 to 2% silicon and the balance substantially all iron.

4,007,066

MATERIAL HAVING A HIGH MAGNETIC PERMEABILITY

Kenzaburo Iijima, and Tomoo Yamagishi, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 338,608, March 6, 1973, abandoned. This application Mar. 12, 1975, Ser. No. 557,837
Claims priority, application Japan, Mar. 13, 1972, 47-25409
Int. Cl.² C04B *35/00*
U.S. Cl. 148—31.55 **11 Claims**

1. A worked and heat treated magnetic alloy having a high magnetic permeability, consisting of: a base composition consisting of 75–82 weight percent of nickel, 2–6 weight percent of molybdenum, 1 or less weight percent of manganese, 1 or less weight percent of silicon and 7.8–18 weight percent iron; and an additive consisting of at least three different elements, one of said elements being an element selected from a first group of elements including zirconium, vanadium, tantalum, chromium or tungsten; a second element selected from a second group and being titanium, zirconium, vanadium, niobium, tantalum, chromium or tungsten and a third element said element of the second group being different from said element of the first group, said third element being different from said elements of said first group and of said second group; said additive being contained in said alloy in a total amount within the range of 1–8 weight percent, wherein said alloy is characterized by a Hv of at least 160 and a μ of at least 10,000.

4,007,067

METHOD FOR MAKING AND USING HOT STAMP TAPE

Richard E. Dunning, Hammond, Ind., assignor to Avery Products Corporation, San Marino, Calif.

Continuation of Ser. No. 233,463, March 10, 1972, abandoned, which is a division of Ser. No. 188,423, Oct. 12, 1971, Pat. No. 3,666,516. This application Mar. 27, 1975, Ser. No. 562,851
Int. Cl.² B44C *1/16;* **B41M** *3/12;* **B44C** *1/20*
U.S. Cl. 156—61 **16 Claims**

1. In a method for forming on a substrate a finish having a surface in which discrete spaced apart portions vary in specular reflectance from the remaining portions of the surface, the steps of:

providing a heat-resistant, flexible, foldable carrier sheet having a surface having a predetermined specular reflectance;

coating onto said carrier sheet surface a plurality of discrete spaced apart portions of a synthetic resinous material, said spaced apart portions being coated onto the carrier in a fluid condition and shrunk during drying to form irregularly-shaped surfaces remote from the surface of the carrier sheet and having a lower specular reflectance than that of the uncoated portion of the carrier sheet surface, said spaced apart portions being so adherently attached to the carrier sheet that they will not transfer from the carrier when heat and pressure are applied thereto;

coating over the surface of the carrier sheet and said spaced apart portions a transferable replicating layer comprising a coating of sufficient thickness of a synthetic resinous material to replicate both the specular reflectance of the uncoated portion of the carrier sheet surface and the specular reflectance of the remote surfaces of said spaced apart portions without said spaced apart portions transferring from the carrier sheet;

providing an adherence coat for adhering the transferable replicating layer to a substrate;

pressing the carrier sheet and the replicating layer against the substrate and applying heat to adhere the replicating layer to the substrate; and

releasing the carrier sheet and said adherently attached

spaced apart portions from the surface of the replicating layer to provide the replicating layer as a surface finish attached to the substrate and having a plurality of discrete spaced apart portions having a lower specular reflectance than the remaining portion of the surface finish.

11. A method for making a hot transfer sheet comprising a carrier sheet and transferable material on one side of the carrier sheet, in which said transferable material is releasable from the carrier sheet and said transferable material is adherently attachable to a substrate in response to heat and pressure, the method comprising the steps of:

providing a heat-resistant, flexible, foldable carrier sheet having a surface having a predetermined specular reflectance;

coating onto said carrier sheet surface a plurality of discrete spaced apart portions of a synthetic resinous material, said spaced apart portions being coated onto the carrier in a fluid condition and shrunk during drying to form irregularly-shaped surfaces remote from the surface of the carrier sheet and having a lower specular reflectance than that of the uncoated portion of the carrier sheet surface, said spaced apart portions being so adherently attached to the carrier sheet that they will not transfer from the carrier when heat and pressure are applied thereto;

coating over the surface of the carrier sheet and said spaced apart portions a transferable replicating layer comprising a coating of sufficient thickness of a synthetic resinous material to replicate both the specular reflectance of the uncoated portion of the carrier sheet surface and the specular reflectance of the remote surfaces of said spaced apart portions without said spaced apart portions transferring from the carrier sheet; and

providing an adherence coat for adhering the transferable replicating layer to a substrate;

the carrier sheet and replicating layer being adherently attachable to a substrate, with the carrier sheet and said spaced apart portions being releasable from the surface of the replicating layer in response to the application of heat and pressure, without the spaced apart portions transferring from the carrier sheet, so that the surface of the replicating layer provides a surface finish having a plurality of discrete spaced apart portions having a lower specular reflectance than the remaining portion of the surface finish.

4,007,068

METHOD FOR PRESS-BONDING MOLDING OF BREAKER LAYERS FOR RADIAL TIRES

Hiroshi Uotani, Higashimurayama; Masayoshi Kubo, and Nobuhiko Irie, both of Nagasaki, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed June 5, 1975, Ser. No. 584,198

Claims priority, application Japan, June 13, 1974, 49-66506

Int. Cl.² B29H *17/18*

U.S. Cl. 156—123 **1 Claim**

1. A method for molding a radial tire breaker layer, comprising:

a. winding a first breaker ply upon the cylindrical, radially outer peripheral surface of a molding drum;

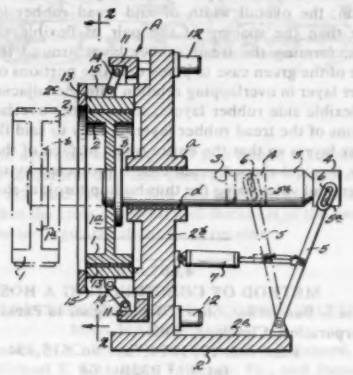
b. radially surrounding the first breaker ply with a radially expansible-contractile, pressure-applying member and uniformly radially contracting this member about the circumference thereof, thereby pressing the first breaker ply against said peripheral surface of the molding drum;

c. radially expanding the pressure-applying member away from the first breaker ply and removing this member from radially surrounding the first breaker ply;

d. winding a second breaker ply upon the first breaker ply;

e. radially surrounding the second breaker ply with a radially expansible-contractile, pressure-applying member and uniformly radially contracting this member about the circumference thereof, thereby pressing the second breaker ply against said first breaker ply, and the first breaker ply against said peripheral surface of the molding drum to unite the first and second plies into a two ply breaker layer;

f. radially expanding the pressure-applying member away from the second breaker ply and removing this member from radially surrounding the two ply breaker layer;



g. for instances where a breaker layer of more than two plies is wanted, repeating steps (d), (e) and (f), thereby adding and uniting successive plies to the breaker layer to provide a multiple-ply breaker layer; and

h. generally radially contracting the molding drum to facilitate removal of the breaker layer; and

i. withdrawing the breaker layer from the contracted molding drum as an independent, unitary structure.

4,007,069

PROCESS FOR MAKING RADIAL TIRES

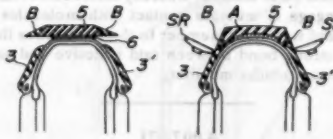
Toshiaki Takayanagi, Kodaira; Hiroaki Tsubakihara, Kurume, and Hiroshi Fukuyama, Higashi-Murayama, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Continuation of Ser. No. 464,667, April 26, 1974, abandoned, which is a continuation of Ser. No. 212,937, Dec. 28, 1971, abandoned. This application July 9, 1975, Ser. No. 594,288

Claims priority, application Japan, Dec. 29, 1970, 46-120690

Int. Cl.² B29H *17/14, 17/26*

U.S. Cl. 156—123 **7 Claims**



1. A process for making a pneumatic radial tire comprising forming a carcass means having at least one rubberized carcass ply directly on a cylindrical former, securing a pair of highly flexible side rubber layers in spaced relation to said carcass ply to form the outer part of the sidewalls of the tire, said carcass ply consisting of cords disposed at 70° to 90° to the equatorial direction of the tire, said side rubber layers consisting of a flexible rubber having a Shore A hardness upon vulcanization of 40° to 55°, forming a green case by forming the carcass means and side rubber layers into a toroidal shape, securing a rubberized breaker layer and a preformed tread rubber layer to the tire crown, said breaker layer consisting of cords disposed at 10° to 30° to the equatorial direction of the

tire, said tread rubber layer consisting of a central body portion having a width equal to the width of the tire crown and at least a portion of the shoulders and being made of a highly abrasion-resistant hard rubber material with a Shore A hardness upon vulcanization of 55° to 75° and in addition a pair of edge portions made of flexible rubber material like said side rubber layers and integrally prebonded to said central body portion to cover the opposing side edges of said central body portion, the overall width of said tread rubber layer being wider than the spacing of the pair of flexible side rubber layers, forming the tread rubber layer around the toroidal shape of the green case to place the edge portions of the tread rubber layer in overlapping relation with the adjacent edges of the flexible side rubber layers, securing the overlapped edge portions of the tread rubber layer directly to said flexible side rubber layers so that the entire outer surface of the sidewalls of the toroidal-shaped green case is protected by said flexible rubber, and vulcanizing the thus builtup toroidal-shaped green case.

4,007,070

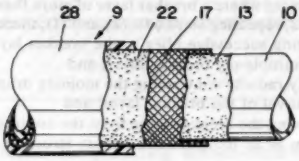
METHOD OF CONSTRUCTING A HOSE

Wayne S. Busdiecker, Stow, Ohio, assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Oct. 17, 1974, Ser. No. 515,494

Int. Cl.² B32B *1/08*

U.S. Cl. 156—143 **8 Claims**



1. The method of constructing a hose comprising providing a core tube of polyamide plastic material, coating the outer surface of the core tube with a solution comprising a urethane adhesive, resorcinol and a solvent from the group comprising dimethylforamide, acetone, methylethylketone, methylisobutylketone, methylene chloride and 1-1-1 trichlorethylene, heating the coating to evaporate therefrom a major portion of said solvent so that only a minor portion thereof remains in the coating, and applying an outer tubular member of solid wall plastic material from the group comprising polyester, polyurethane and polyvinyl chloride into contact with said coating, said resorcinol plastisizing and wetting said outer surface of said core tube and said solvent remainder wetting the inner surface of said outer member whereby molecules of said adhesive will engage in intimate contact with molecules of said core tube and said outer member to share electrons therewith to form a strong bond between said adhesive and said core tube and outer tubular member.

4,007,071

PROCESS FOR MAKING EMBOSSED NEEDLE-BONDED FABRIC WALL COVERINGS

Lee W. Addie, Millersville, and Harold W. Nikolaus, Columbia, both of Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Division of Ser. No. 475,326, May 31, 1974, Pat. No. 3,924,040. This application May 27, 1975, Ser. No. 581,264

Int. Cl.² B32B *3/00, 5/06, 31/08*

U.S. Cl. 156—148 **3 Claims**

1. A process for making a fabric comprising the steps of:
   a. moving a scrim with a coarse open weave structure towards a needle-bonding means,
   b. placing on the upper surface of the scrim a non-woven felted fabric,
   c. passing both the scrim and its overlying felted fabric covering through a needle-bonding means to needle-bond the felted fabric to the scrim by mechanically locking the fibers of the felted material to the scrim and to themselves,
   d. passing the resulting composite product, with the felted fabric facing upward, to an embossing structure which has its embossing means engaging the upper surface of the composite product,
   e. heating said embossing means to a temperature which is approximately equal to the melt temperature of the felted

   fabric and substantially below the melt temperature of the scrim; and
   f. embossing a pattern on the side of the composite structure containing the felted fabric to provide a definite pattern to the composite product while, at the same time, causing a softening of the individual fibers of the felted fabric to cause said felted fabric to assume the general surface contour of the scrim, whereby there is produced an end product which has both a definite pattern as provided by the embossing means and an irregular surface texturing which results from the softened felted fabric assuming generally the surface contour of the scrim.

4,007,072

FERROMAGNETIC METAL POWDER COMPRISING LEAD AND METHOD FOR MAKING THE SAME

Masashi Aonuma, and Yasuo Tamai, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Nov. 18, 1974, Ser. No. 524,858

Claims priority, application Japan, Nov. 16, 1973, 48-128988

Int. Cl.² H01F *1/02*

U.S. Cl. 148—105 **25 Claims**

1. A ferromagnetic metal powder for a magnetic recording medium comprising
   a. about 30 to 95% by weight of Fe;
   b. about 0.5 to 20% by weight of B;
   c. about 0.1 to 20% by weight of Pb; and
   d. about 0 to 70% by weight of Co and/or Ni produced by reducing in an aqueous solution a metal salt containing at least Fe and capable of forming a ferromagnetic substrance and using at least one member selected from the group consisting of a borohydride compound and a derivative thereof wherein said reduction is in the presence of at least one lead compound in said aqueous solution.

4,007,073

METHOD OF PRODUCING ARTICLES HAVING ALTERNATING MAGNETIC AND NON-MAGNETIC PORTIONS FROM CONTINUOUS METAL BLANKS

Felix Lvovich Levin, Novo-Khoroshevskoe shosse, 26, korpus 3, kv. 29; Sergei Alexandrovich Golovanenko, 9 Parkovaya ulitsa, 57, korpus 3A, kv. 12, and Vladimir Alexandrovich Dmitriev, ulitsa Plekhanova, 3, korpus 5, kv. 73, all of Moscow, U.S.S.R.

Continuation of Ser. No. 515,023, Oct. 15, 1974, abandoned, which is a continuation of Ser. No. 371,872, June 20, 1973, abandoned. This application Aug. 4, 1975, Ser. No. 601,406

Int. Cl.² H01F *1/00*

U.S. Cl. 148—120 **8 Claims**

1. A method of producing an integral metal article having both magnetic and non-magnetic portions comprising the steps of: selecting a metal article made of an alloy having an unstable austenitic structure and consisting essentially of, by

weight, 0.03–0.3% carbon, 12–17% chromium, 30–55% cobalt, up to 7% molybdenum and the balance being iron; and plastically deforming portions of the article intended to form a magnetic structure at a temperature of from 0° to 800° C until the portions acquire the magnetic structure.

4,007,074

METHOD OF MAKING AN EPITAXIAL GROWTH LAYER OF $GAAS_{1-x}P_x$ COMPOUND SEMICONDUCTOR

Masahiko Ogirima, Shinjyuku; Toshimitu Shinoda, Hamura; Yuichi Ono, Kokubunji, and Hajime Kusumoto, Tama, all of Japan, assignors to Hitachi, Ltd., Japan

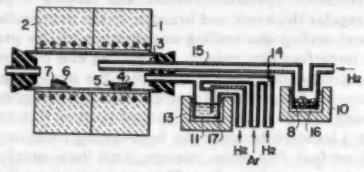
Filed Jan. 8, 1971, Ser. No. 105,006

Claims priority, application Japan, Jan. 9, 1970, 45-2487; Jan. 9, 1970, 45-2488

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² H01L *21/205, 21/18*

U.S. Cl. 148—175 **18 Claims**



1. A method of making an epitaxial growth layer of $GaAs_{1-x}P_x$ ($0<x<1$) compound semiconductor on a seed material that is crystallographically compatible with the layer, comprising the steps of:

disposing a source material including Ga and said seed material in a reaction tube spaced from each other;

maintaining said source material at a temperature higher than that of said seed material;

heating element As to a temperature so as to obtain a controlled amount of As_4 gas;

heating elemental P to a temperature so as to obtain a controlled amount of P_4 gas;

introducing a gaseous material selected from the group consisting of a mixture of PCl_3, As_4 gas produced from said heated elemental As and H_2 gas, or a mixture of P_4 gas produced from said heated elemental P, $AsCl_3$, and H_2 gas into the reaction tube so as to contact at least said gaseous material with said source material, whereby a reaction gas including GaCl is produced; and

contacting said reaction gas with said seed material.

4,007,075

METHOD OF MAKING A FIBERGLASS POLE

Stephen A. McClain, Puyallup; Harvey A. Doman, Tacoma, and Richard D. Entus, Gig Harbor, all of Wash., assignors to Cascade Pole Company, Tacoma, Wash.

Continuation of Ser. No. 422,994, Dec. 10, 1973, abandoned, which is a division of Ser. No. 298,028, Oct. 16, 1972, Pat. No. 3,813,837. This application June 16, 1975, Ser. No. 587,127

Int. Cl.² B31C *3/00;* **B65H** *81/08*

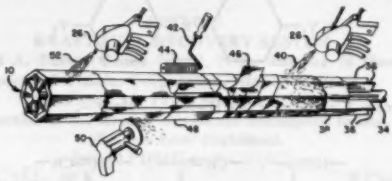
U.S. Cl. 156—62.2 **9 Claims**

1. A method of making a fiberglass pole of integral multisided cross section by spraying a mixture of chopped glass, resin and catalyst on a rotating mandrel, wrapping said mixture with one or more layers of fiberglass webbing, allowing said fiberglass to cure and removing said pole from said mandrel, the improvement comprising:

initially mounting a mandrel having a center shaft and a plurality of longitudinal fins equal in number to the cross-sectional sides of the pole to be formed extending radially outward therefrom in a rotatable chuck;

loosely wrapping said finned mandrel with a thin sheet of paper such that the inner surface of said paper lightly overlies the fins of said mandrel; and,

pressing said sprayed on chopped glass, resin and catalyst



mixture and said webbing onto said finned mandrel with rollers to deform said thin sheet of paper such that said paper and said mixture bow inwardly between said fins such that the cross sectional wall thickness of the finished pole varies regularly about its perimeter.

4,007,076

POST-PRESS EMBOSSING OF A CONSOLIDATED MAN-MADE BOARD

John T. Clarke, St. Charles; Royce K. Harker, Lombard, both of Ill.; Michael E. Hittmeier, Towanda, Pa., and James W. Eaton, Elgin, Ill., assignors to Masonite Corporation, Chicago, Ill.

Filed Dec. 30, 1974, Ser. No. 537,254

Int. Cl.² B29J *5/04;* **B31F** *1/00*

U.S. Cl. 156—62.8 **12 Claims**

1. A method of embossing a decorative man-made board comprising wetting the surface of a consolidated man-made board with an aqueous liquid in an amount sufficient to wet substantially the entire surface to be embossed, embossing the wetted man-made board with a contoured embossing plate at a pressure of at least about 1000 p.s.i., at a temperature in the range of about 400°–550° F. and for a period of time sufficient to permanently reshape at least one surface of the man-made board.

4,007,077

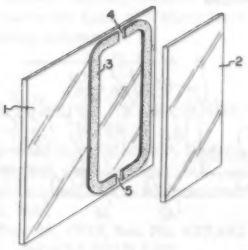
LIQUID CRYSTAL CELLS

Masachika Yaguchi, Yokohama, Japan, assignor to Dai Nippon Toryo Kabushiki Kaisha, Japan

Continuation of Ser. No. 428,839, Dec. 27, 1973, abandoned. This application Aug. 21, 1975, Ser. No. 606,493

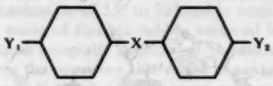
Int. Cl.² B32B *31/00*

U.S. Cl. 156—145 **8 Claims**

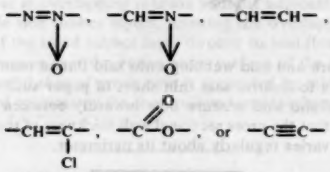


1. Process for sealing a liquid crystal cell having two planar supports fixed at limited intervals by a spacer and having at least one opening for pouring into the cell a liquid crystal material which process comprises pouring said liquid crystal material through said opening into the cell and applying at least one cyanoacrylate compound to each said opening thereby forming instantaneously an insoluble cured film on the boundary between the liquid crystal layer and the sealed

layer, said liquid crystal material consisting essentially of at least one compound having the formula:



wherein X represents —CH=N—, —N=N—,



radicals, and Y_1 and Y_2 each independently represents halogen or —R, —OR, —COR, —CN, —OCOOR or —OCOR radicals wherein R is hydrogen or a hydrocarbon radical having from 1 to 4 carbon atoms, and said cyanoacrylate compound having the formula:

wherein R is a hydrocarbon radical having 1 to 5 carbons atoms, whereby an insoluble cured film seal is formed between the seal layer and the liquid crystal layer so that incorporation or effusion of impurities into the liquid crystal layer is prevented and the liquid crystal cell so formed has improved mesomorphic range, current density and life.

4,007,078

METHOD FOR CONTINUOUSLY SUPPLYING PLASTICS FILM STRIP FROM EXTRUDER HEAD

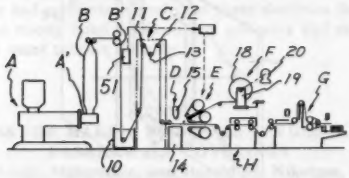
Seiji Aoki; Akira Kamiyana, both of 52, 2, 1-chome, Gamonishi, Koshigaya, and Kokichi Matsuda, 6-3-504, Takesato, 89, Oeda, Kasukabe, all of Japan

Filed Nov. 1, 1974, Ser. No. 520,214

Claims priority, application Japan, Nov. 1, 1973, 48-122173; Nov. 7, 1973, 48-124420

Int. Cl.² B31F *5/00*; B29C *19/00*

U.S. Cl. 156—159 **1 Claim**



1. A method of continuously supplying a film strip of a thermoplastic synthetic resin from an extruder, forming the strip, to a processing machine such as a printing machine, bag-making machine or packaging machine, said method comprising the steps of leading a film strip, supplied from the extruder during initial operation thereof and lacking a predetermined regular thickness and breadth, along a first passage for imperfect film strip, for winding thereof at a location adjacent but spaced from a processing machine; continuing winding of the initially extruded film strip until the wound extruded film strip has such predetermined regular thickness and breadth and then interrupting such winding; reversely drawing the trailing end portion of a heat-weldable coupling film strip, previously supplied to the processing machine along a second perfect film strip passage and having such predetermined regular thickness and breadth, away from the processing machine to engage the newly extruded film strip at a heat sealing location upstream of the first passage; heat-sealing such trailing end portion of the coupling film strip to the newly extruded film strip at the heat-sealing location; severing the newly extruded film strip between the heat-sealing location and the first passage; drawing the coupling film strip, joined to the newly extruded film strip having such predetermined regular thickness and breadth, toward the processing machine to continuously supply a film strip, having such predetermined regular thickness and breadth, to the processing machine; following an interruption of the operation of the extruder and the processing machine, restarting the method by reversely drawing the trailing end portion of the wound imperfect film strip away from the winding location to the heat-sealing location; leading a film strip, supplied from the extruder during initial restarted operation thereof and lacking a predetermined regular thickness and breadth, to the heat-sealing location; heat-sealing the trailing end portion of the previously wound imperfect film strip to the leading end portion of the newly extruded imperfect film strip at the heat-sealing location; severing the perfect film strip, previously supplied to the processing machine along the second perfect film strip passage, at a location between the heat-sealing location and the second perfect film strip passage; and then supplying the previously wound imperfect film strip joined to the newly extruded imperfect film strip, lacking such predetermined regular thickness and breadth, along the first passage, for imperfect film strip, for winding thereof at the winding location until the wound extruded film strip supplied from the re-started extruder has such predetermined regular thickness and breadth, and then performing the first-mentioned method steps.

4,007,079

EPOXY COMPOSITION AND ITS USE AS AN ADHESIVE

Richard J. Turley, Orange, and Alexandre Ozolins, New Haven, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Oct. 28, 1975, Ser. No. 626,288

Int. Cl.² C08G *59/18*

U.S. Cl. 156—330 **16 Claims**

1. A liquid, curable epoxy composition comprised of

a. an epoxy resin having more than one α-epoxy group in the molecule,

b. a curing agent for said resin, and

c. a chlorine-containing polyol having an average of 2–8 hydroxy groups which is comprised of the product of the acid-catalyzed condensation of a polyhydroxy initiator with 4,4,4-trichloro-1,2-epoxybutane or a mixture thereof with a halogen-free epoxide.

4,007,080

DEVICE FOR TRANSFERRING TIRE CARCASSES FROM A TIRE BUILDING-UP STATION TO A FORMING STATION

Friedrich Klöpper, Barsinghausen, Germany, assignor to Continental Gummi-Werke Aktiengesellschaft, Hannover, Germany

Filed Feb. 27, 1975, Ser. No. 553,823

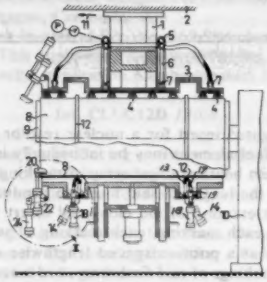
Claims priority, application Germany, Feb. 28, 1974, 2409586

Int. Cl.² B29H *17/10*

U.S. Cl. 156—396 **10 Claims**

1. A device for transferring a tire carcass having a substantially cylindrical outer surface and provided with bead core rings from a tire building-up station to a shape forming station,

the improvement in combination therewith which includes: annular holding means composed of segments and provided with suction cups adapted to be placed onto the outer substantially cylindrical surface of the carcass to be transferred for supporting said carcass, said holding means being variable in diameter and including supporting elements for the bead core rings of a carcass, carrier means carrying said holding means and operable to transfer said holding means from said tire



building-up station to said shape forming station, and curved segmental supporting means supported by said holding means for supporting at least one end portion of a carcass to be carried by said suction cup equipped holding means, said supporting elements for the bead core rings being formed by plier-shaped clamping jaws distributed uniformily over periphery of said holding means as well as abutment jaws provided therewith for supporting the bead core rings.

4,007,081

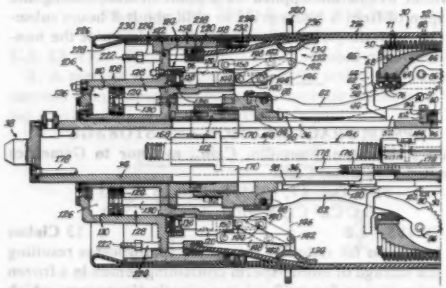
TIRE BUILDING APPARATUS

Edwin E. Mallory, Niles, Mich., assignor to National-Standard Company, Niles, Mich.

Filed Nov. 11, 1974, Ser. No. 522,484

Int. Cl.² B29H 17/26

U.S. Cl. 156—417 **16 Claims**



1. A tire building apparatus for building a complete tire in a single operation, the apparatus having an intermediate radially expandable drum, intermediate drum expanding and contracting means associated with the intermediate expandable drum to dispose the same in positions defining rigid supporting surfaces of different radii, and end drum assembly at each end of the intermediate drum, the intermediate drum and the end drum assemblies providing support of tire carcass material therearound, and the end drum assemblies having tire bead locating and supporting means for the beads of the tire carcass and ply turn up means, the combination including

resilient expansion means as part of the intermediate drum expanding and contracting means for effecting at least a partial actuation of the intermediate drum expansion means, and

positive centering means for axially positioning the intermediate drum to maintain the center line of the tire carcass midway between the beads of the tire carcass.

4,007,082

KRAFT MILL RECOVERY SYSTEM

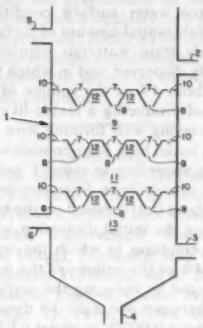
Willard A. Fuller, Grand Island, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Aug. 15, 1975, Ser. No. 605,094

The portion of the term of this patent subsequent to Dec. 7, 1993, has been disclaimed.

Int. Cl.² D21C 11/04, 11/12

U.S. Cl. 162—30 K **9 Claims**



1. In the process for the pulping of lignocellulosic material comprising the steps of looking the material with pulping liquor, evaporation of the pulping liquor, combustion of the pulping liquor and precipitation as precipitator catch of the solids that are admixed with the combustion gases, said precipitator catch containing sodium sulfate, sodium chloride, sodium carbonate and organic material,

the process which comprises adding water to said precipitator catch to produce a flowable slurry thereof in a slurry tank,

adding carbon dioxide to said slurry in an amount sufficient to convert said sodium carbonate to sodium bicarbonate,

and separating said sodium chloride from said sodium sulfate and said sodium bicarbonate by passing said precipitator catch in a downward flow in a separatory column;

countercurrently passing hot water upwardly through said column at a rate sufficient to effect washing of the downwardly flowing slurry;

removing said sodium sulfate, sodium bicarbonate and organic material in the form of a slurry from the bottom of said separatory column.

4,007,083

METHOD FOR FORMING WET-LAID NON-WOVEN WEBS

Michael Ring, Warwick, N.Y.; Madhu P. Godsay, New Delhi, India; Roy S. Swenson, Central Valley, N.Y., and Joseph N. Kent, Lewisburg, Pa., assignors to International Paper Company, New York, N.Y.

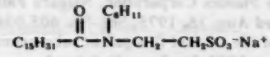
Filed Dec. 26, 1973, Ser. No. 427,482

Int. Cl.² D21D 3/00

U.S. Cl. 162—101 **15 Claims**

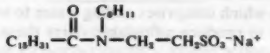
1. The method of uniformly dispersing selected non-fibrillated fibers in a substantially binder free aqueous medium, a majority of the fibers being man made nonfibrillatable hydrophobic fibers of not less than about ¼ inch in length and with a length to diameter ratio of between about 400:1 to about 700:1 including the steps of combining: water, a sufficient amount of the selected fibers for a dispersion having a fiber consistency of between about 0.35% to about 2% based on the bone dry weight of the fibers, and between about 0.007% to

about 0.03% by weight of a wetting agent consisting of a selected combination of alkylaryl polyether alcohol (octylphenol series) and N-cyclohexyl-N-Palmitoyl-Taurine having the formula



in a container to reduce the surface tension of the water to between about 30–35 dynes, and vigorously agitating the mixture in the container in the presence of air to create the tumbling vortex-free water surface conditions without the generation of any substantial amount of surface foam, thereby generating a steady state water/air emulsion in which the fibers are uniformly dispersed and in which the volume of air does not exceed about 4% of the volume of the water.

5. The method of producing a textile-like nonwoven sheet material on a wet-laying web forming wire characterized by forming a uniform initial high fiber consistency dispersion in a water/air emulsion according to claim 1 and thereafter diluting the dispersion to a uniform fiber consistency of between about 0.006% to about 0.01% based on the bone dry weight of the fibers by mixing the initial dispersion with a steady state water/air dilution emulsion in which the volume of air does not exceed about 4% of the volume of the water; which emulsion has been created by reducing the surface tension of the dilution water to between about 30–35 dynes by the addition to it of between about 0.007% to about 0.03% by weight of a wetting agent consisting of a selected combination of alkalaryl polyether alcohol (octylphenol series) and N-cyclohexyl-N-Palmitoyl-Taurine having the formula



and by vigorously agitating the dilution water with this wetting agent in it in the presence of air to create the water/air dilution emulsion without the generation of any substantial amount of surface foam; and then draining the non-fiber portion of the diluted fiber dispersion through the web forming wire to form the material.

4,007,084

DRY STRENGTH PAPER AND PROCESS THEREFOR

Lock-Lim Chan, Whitby, and Arthur Herbert Guitard, Pickering, both of Canada, assignors to Borden Products Limited, West Hill, Canada

Filed June 25, 1975, Ser. No. 590,313

Int. Cl.² D21D *3/00*

U.S. Cl. 162—167 **15 Claims**

1. A process for the manufacture of paper of improved dry strength and negligible wet strength comprising forming an aqueous suspension of fibrous cellulosic material containing a polymeric reaction product of a ketone, aldehyde and a polyamine in sufficient amount to impart the desired dry strength to the paper; the mol ratios of the reactants being from 1.8 to 4 mols of the aldehyde and from 0.1 to 1 mol of the amine per mol of the ketone; and the reaction to form the product is carried out at pH of 8 to 10.

4,007,085

NUCLEAR REACTOR FUEL ELEMENTS

Albert Woodacre, Blackpool, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Jan. 20, 1975, Ser. No. 542,512

Claims priority, application United Kingdom, Jan. 21, 1974, 2753/74

Int. Cl.² G21C *3/10*

U.S. Cl. 176—80 **4 Claims**

1. An elongated insert for a nuclear reactor fuel element whereby the fuel element may be individually identified, the elongated insert bearing a first array of markings at positions spaced along the length of said insert to produce a series of signals on presentation of the elongated insert to a detector responsive to each marking, each marking of said first array being located at a position spaced lengthwise of said insert from other markings of said first array, and a second array of markings at positions spaced along the length of said insert to vary the series of signals produced by the first array of markings on presentation to the detector, the marking of said second array being located at only some of the positions of said first array of markings.

4,007,086

INTERFERON INDUCTION

Ramon D. Hamilton, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Jan. 23, 1975, Ser. No. 543,508

Int. Cl.² C12K *9/00;* **B01J** *1/10;* **A61K** *45/02*

U.S. Cl. 195—1.8 **22 Claims**

1. In the method of producing interferon in vitro which consists of inducing interferon-producing human or animal cells with an inducing-effective amount of a non-viral interferon inducer, the improvement comprising irradiating the cells with from about 50 ergs/mm² to about 2500 ergs/mm² of ultraviolet irradiation applied at a point in time during the time span of from 8 hours prior to until about 4 hours subsequent to, including concurrent with, the addition of the non-viral interferon inducer.

4,007,087

SPERM FRACTIONATION AND STORAGE

Ronald J. Ericsson, Sausalito, Calif., assignor to Gametrics Limited, Sausalito, Calif.

Filed Oct. 17, 1975, Ser. No. 623,543

Int. Cl.² C12K *9/00;* **A61K** *35/52*

U.S. Cl. 195—1.8 **13 Claims**

1. A process for reducing the motile sperm losses resulting from the storage of motile-sperm containing semen in a frozen state prior to use for artificial insemination purposes, which comprises (a) separating the motile sperm from the other components of the semen prior to freezing by (i) maintaining at least the sperm portion of the semen, as such or suspended in an aqueous suspending vehicle which is physiologically acceptable to the sperm and which does not substantially retard the downward migration rate of motile sperm, as an upper layer in interfacial contact, at a temperature at which the motile sperm are motile, with a lower discrete layer of an aqueous contacting medium which is physiologically acceptable to the sperm and in which the motile sperm migrate downwardly at a slower rate than in the upper layer, until at least a portion of the motile sperm of the separated sperm have migrated downwardly into the contacting medium, thereby producing a sperm fraction having a higher proportion of motile sperm than in the starting sperm, and (ii) thereafter separating the contacting medium, containing the motile

sperm enhanced fraction of the starting sperm, from the upper layer; and (b) storing the separated motile sperm fraction in a frozen state.

4,007,088

PROCESS OF MANUFACTURING NATIVE MICROBIAL PROTEIN WITH A LOW CONTENT OF NUCLEIC ACIDS

Zdenek Fencl; Frantisek Machek, and Vladimir Sillinger, all of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Continuation-in-part of Ser. No. 369,984, June 14, 1973, abandoned. This application Aug. 8, 1975, Ser. No. 603,153
Claims priority, application Czechoslovakia, June 14, 1972, 4170/72
Int. Cl.² C12D *13/06*
U.S. Cl. 195—4 3 Claims

1. A process for producing native microbial protein from single-cell microbial cells having a content of nucleic acids lower than 1% and useful as food or feed, which comprises the steps of:

a. disrupting microbial cells to release the nuclease contained therein and forming thereafter a homogenate having disrupted cells and nuclease;
b. adjusting the pH value of the said homogenate to 5.9–8.0 and maintaining the temperature at 50°–60°C for 20 minutes–2.5 hours in order to permit the degradation of nucleic acids by means of the nucleases contained in the homogenate;
c. precipitating protein material from the microbial homogenate by adjusting the pH value to the isoelectric point of the protein material;
d. separating the precipitated protein material;
e. drying the precipitated protein material;
f. extracting the precipitated and dried protein material with alcohol to remove lipoid substances; and
g. drying again said extracted protein material.

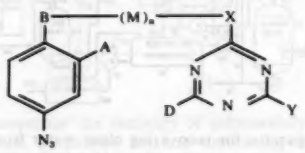
4,007,089

METHOD FOR BINDING BIOLOGICALLY ACTIVE COMPOUNDS

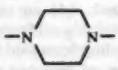
Nathan L. Smith, III, Miami, Fla., assignor to Nelson Research & Development Company, Irvine, Calif.

Filed Apr. 30, 1975, Ser. No. 573,363
Int. Cl.² C07G *7/02*, *7/00*
U.S. Cl. 195—68 7 Claims

1. A method for binding biologically active compounds to carriers comprising reacting an asymmetric bifunctional linking compound having the structural formula



wherein B is selected from the group consisting of NR, O, S,



and CH_2; $(M)_n$ is a saturated or unsaturated hydrocarbon chain; X is selected from the group consisting of N, R, O and S; A is selected from the group consisting of SO_2R, CN, NO_2 and H; Y is selected from the group consisting of N_3, halogen and SH, R is H or a lower alkyl group, D is N_3 or halogen and n is 1-12, with a carrier in the presence of light to form a carrier bound to the linking compound through the phenyl azide moiety, and reacting said carrier bound to the linking compound with a biologically active compound under reaction conditions sufficient to bind the biologically active compound to the linking compound through the *s*-triazine moiety.

4,007,090

NOVEL FERMENTATION PROCESS FOR THE PREPARATION OF SULFOMYCIN

Louis Chaiet, Springfield, N.J.; Sebastian Hernandez, Madrid, Spain, and Sheldon B. Zimmerman, Springfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Apr. 2, 1976, Ser. No. 673,039
Int. Cl.² C12D *9/00*
U.S. Cl. 195—80 R 9 Claims

1. A process for the preparation of Sulfomycin I which comprises fermenting with a Sulfomycin I producing strain of Streptomyces cineroviridis, NRRl 8155 and mutants thereof an aqueous nutrient medium containing an assimilable source of carbon, an assimilable source of nitrogen and inorganic salts under aerobic conditions.

4,007,091

METHOD FOR MEASURING THE ACTIVITY OF LECITHIN CHOLESTEROL ACYL TRANSFERASE AND LECITHIN SUBSTRATE SOLUTION USEFUL THEREFOR

Toshihide Nagasaki, Takarazuka; Masaharu Takayama, Osaka; Akiyoshi Uesugi, Toyonaka; Isao Tanimizu, Ibaraki, and Kazuto Shintani, Toyonaka, all of Japan, assignors to Nippon Shoji Kaisha, Limited, Osaka, Japan

Filed Apr. 29, 1976, Ser. No. 681,410
Claims priority, application Japan, May 2, 1975, 50-53655
Int. Cl.² G01N *31/14*
U.S. Cl. 195—99 10 Claims

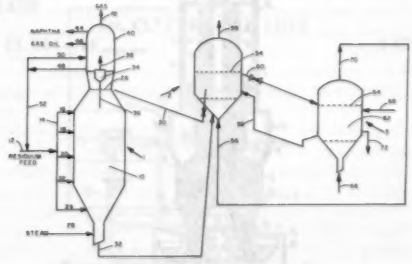
1. A method for measuring the activity of lecithin cholesterol acyl transferase, which comprises adding a test sample to a lecithin substrate solution containing a lecithin and a nonionic surfactant, incubating the mixture and then measuring the changed amount of the free cholesterol in the reaction system by an optical analysis.

4,007,092

PROCESS FOR PRODUCING LOW SULFUR COKE

William J. Metrailer, and Walter Weissman, both of Baton Rouge, La., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Mar. 18, 1975, Ser. No. 559,588
Int. Cl.² C10B *55/10*
U.S. Cl. 201—17 8 Claims



1. In an integrated coking and gasification process for the production of a low sulfur coke comprising the steps of:

reacting a carbonaceous material containing sulfur contaminants, said carbonaceous material having a Conradson carbon content of at least 5 weight percent in a coking zone containing a bed of fluidized solids maintained at a temperature ranging from about 850° to about 1250° F. to

form coke containing sulfur contaminants, said coke depositing on said fluidized solids;

introducing a portion of said solids with the coke deposition thereon into a heating zone operated at a temperature greater than said coking zone temperature to heat said portion of solids;

recycling a first portion of heated solids from said heating zone to said coking zone and introducing a second portion of said heated solids to a fluid bed gasification zone maintained at a temperature of at least 1600° F., and passing a stream of solids from said gasification zone to said heating zone,

the improvement which comprises:

controlling the rate of circulation of said solids between each of said zones such as to maintain the thickness of a shell of deposited coke, subjected to treatment within the gasification zone in a single cycle, ranging at the time of exit from the gasification zone to a thickness not greater than 10 microns, while introducing steam into the lower portion of said fluidized bed gasification zone to produce a hydrogen-containing gas and introducing an oxygen-containing gas into the upper portion of said fluid bed gasification zone to convert at least a portion of said hydrogen to steam and thereby produce at least a portion of the heat requirements of said process and recovering a partially desulfurized coke.

4,007,093

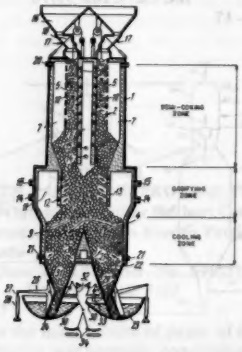
FURNACE FOR THERMAL PROCESSING OF LUMP SOLID FUEL

Svyatoslav Kirillovich Dolov, ulitsa Kalevi, 23, kv. 25; Viktor Mikhailovich Efimov, ulitsa Vyidu, 4, kv. 5; Rikhard Eduardovich Ioonas, ulitsa Ametijukhingu, 7, kv. 25; Nikolai Andreevich Nazinin, ulitsa Vyidu, 12, kv. 30; Enn Edgarovich Piik, Narvskoe shosse, 53, kv. 2, all of Estonskaya SSR, Kokhtla-Yarve; Khans Eduardovich Raad, ulitsa Hyukogude, 42, kv. 24, Estonskaya SSR, Kiviyli; Ivar Kharaldovich Roox, ulitsa Komsomoli, 27, kv. 24; Nikolai Dmitrievich Serebryannikov, ulitsa Lauristini, 5, kv. 17, both of Estonskaya SSR, Kokhtla-Yarve; Jury Vasilievich Shaganov, ulitsa Soo, 13, kv. 10, Estonskaya SSR, Kiviyli; Leonid Semenovich Ananiev, ulitsa Komsomoli, 15, kv. 12, and Alexei Sergeevich Volkov, ulitsa Aia, 7, kv. 5, both of Estonskaya SSR, Kokhtla-Yarve, all of U.S.S.R.

Filed Apr. 30, 1975, Ser. No. 573,009

Int. Cl.² C10B *35/00*, *39/04*, *49/06*; C10J *3/72*

U.S. Cl. 202—121 **15 Claims**



1. A furnace for thermal processing of solid fuel, comprising: a generally hollow body, a first chamber portion located generally at the top of said body and defining a semicoking zone and including at least one gas distillation chamber, a second chamber portion located generally in the lower region of said body and defining a cooling zone, and a third chamber portion generally intermediate said first and second chamber portions and defining a gasifying zone; gas feeding chambers within said body adapted for feeding gas into said semicoking and gasifying zones; a vapor-gas mixture chamber within said body adapted to discharge vapor-gas mixture from said gas distillation chamber; a loading device for charging solid fuel into said first chamber portion of said body; and an unloading device for discharging the solid waste material from said second chamber portion of said body, said unloading device comprising hopper means below said second chamber portion, water seal means for said hopper means, said water seal means having a bottom surface portion, pusher means located above said bottom surface portion of said water seal means and mounted thereto for at least partial movements along said bottom surface portion for advancing waste materials discharged by said hopper means into said water seal means to a discharging zone of said water seal means, first means for operating said pusher means, shovel means disposed generally in said discharging zone, and second means for moving said shovel means so that it shovels the waste material off said bottom surface portion of said water seal means, said pusher means and shovel means being arranged so that said pusher means is generally in its operative mode when said shovel means is generally in its idle condition.

4,007,094

PROCESS AND APPARATUS FOR RECOVERING CLEAN WATER FROM AQUEOUS WASTES

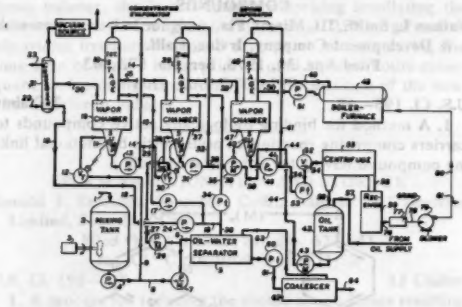
Charles Greenfield, Murray Hill; Robert E. Casparian, Boonton, and Anthony J. Bonanno, Parsippany, all of N.J., assignors to Hanover Research Corporation, East Hanover, N.J.

Continuation-in-part of Ser. No. 165,070, July 22, 1971, Pat. No. 3,947,327. This application Dec. 15, 1975, Ser. No. 640,712

The portion of the term of this patent subsequent to Mar. 30, 1993, has been disclaimed.

Int. Cl.² B01D *1/26*, *3/34*, *3/02*

U.S. Cl. 202—174 **3 Claims**



1. An apparatus for recovering clean water from aqueous wastes, said apparatus comprising (1) a tank adapted to receive a stream of said aqueous wastes, (2) an evaporator, (3) a conduit extending from said tank to the evaporating region of said evaporator wherethrough may flow a stream of aqueous wastes from said tank, (4) an oil-water separator, (5) means for transmitting volatile oil from said oil-water separator to said conduit extending from said tank to said evaporator whereby a mixed stream of aqueous wastes and volatile oil may be conducted into the evaporating region of said evaporator, (6) a condenser, (7) a conduit extending from said evaporator to the condensing region of said condenser through which may flow a vapor of water and volatile oil formed as a result of evaporation of said mixture of aqueous wastes and volatile oil, (8) a conduit extending from said condenser to said oil-water separator wherethrough may flow a liquid mixture of water and volatile oil formed as a result of condensa-

tion of said vapor of water and volatile oil, (9) evaporative means for dehydrating mixtures of concentrated aqueous wastes and volatile oil, (10) a conduit extending from said evaporator to said evaporative means wherethrough may flow a mixed stream of concentrated aqueous wastes and volatile oil from said evaporator, and (11) a conduit extending from said evaporative means to the heating region of said evaporator through which may flow a vapor of water and volatile oil formed as a result of dehydration of said concentrated aqueous wastes and volatile oil mixture, said vapor of water and volatile oil supplying evaporative heat to said evaporator.

4,007,095
RECOVERY OF ANHYDROUS DIOXANE EXTRACTIVELY DISTILLED WITH DIOLS OR ALKANOLAMINE

Dieter Wolf, Gruenstadt; Eberhard Bender, and Theodor Weber, both of Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

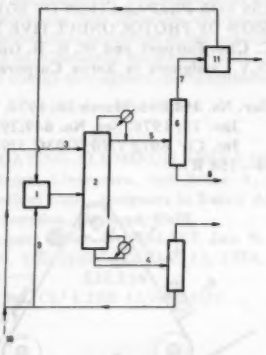
Filed May 2, 1974, Ser. No. 466,304

Claims priority, application Germany, May 5, 1973, 2322709

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² B01D *3/00*

U.S. Cl. 203—59 **3 Claims**



1. A process for the recovery of substantially anhydrous dioxane from a reaction mixture containing dioxane and minor amounts of water, 1-methyldioxolane and acetaldehyde as impurities which comprises feeding dioxane containing minor amounts of water, 1-methyldioxolane and acetaldehyde as impurites to the middle portion of an extractive distillation column, also feeding to the top of said column a solvent selected from the group consisting of ethylene glycol, diethylene glycol, triethylene glycol, propylene glycol, dipropylene glycol, tripropylene glycol, propanetriol, propanediol, butanediol, a mono-lower alkanolamine, a di-lower alkanolamine, a tri-lower alkanolamine, and mixtures thereof at proportions of said solvent to dioxane in the range of 0.1:1 to 100:1, distilling off as overhead from said column substantially anhydrous dioxane plus the 1-methyldioxolane and acetaldehyde impurities, removing as bottoms from said column said solvent and most of the water impurity, and distilling said overhead to recover substantially pure dioxane.

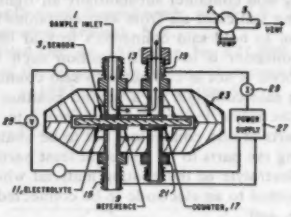
4,007,096
TRACE GAS DETECTION METHOD

Raymond J. Jasinski, and Isaac Trachtenberg, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 370,898, June 18, 1973, Pat. No. 3,909,384. This application May 1, 1975, Ser. No. 573,666

Int. Cl.² G01N *27/46*

U.S. Cl. 204—1 T **10 Claims**



1. A method of detecting the presence of gaseous NO_2 and more strongly oxidizing gases in a gaseous atmosphere including at least one gas taken from the group consisting of CO, O_2, N_2, SO_2, NO and chemically compatible mixtures of these gases, said method comprising:

providing an electro-chemical gas sensing cell including a sensor formed of a doped chalcogenide glass consisting of about 60 mole percent selenium, 28 mole percent germanium, 12 mole percent antimony and containing as a dopant about 1% to about 4% by weight of iron, an electrolyte contacting a side of said sensor, and a reference electrode contacting said electrolyte,

exposing the doped chalcogenide glass sensor on the side opposite to said electrolyte — contacting side to a sample of the gaseous atmosphere, and

measuring the electrical signal developed by the cell in response to the exposure of the doped chalcogenide glass sensor to the gas sample.

4,007,097
PROCESS FOR SELECTIVELY APPLYING A METAL COATING TO THE METALLIC PARTS OF ELEMENTS WHICH PASS THROUGH AN INSULATOR

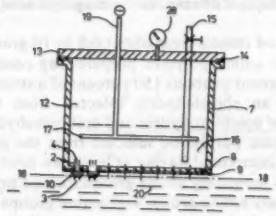
Francis X. Noz, Triesen, Switzerland, assignor to Galentan A.G., Zug, Switzerland

Filed Oct. 4, 1974, Ser. No. 512,398

Claims priority, application Switzerland, Oct. 4, 1973, 14213/70

Int. Cl.² C25D *5/02, 17/16*

U.S. Cl. 204—15 **1 Claim**



1. A process for selectively applying a coating of a precious metal such as gold, to the metal parts of electrical components of a type having a housing in which electrical connectors have ends protruding through the sides thereof, comprising the steps of:

arranging said components in a fluid-tight fashion in apertures of an electrically insulating template in a manner such that the parts to be coated project on one side, and the parts not to be coated on the other side of the template, said template comprising the wall of a container and the parts not to be coated project inwardly of said container and the parts to be coated project exteriorly thereof,

partially fillng said container with a chemically inactive first electrolyte,

rendering said container substantially air tight,

evacuating sufficient air from said container to produce a vacuum to hold said connectors to said template while said container is in a first position such that the first electrolyte is not in contact with said connectors,

inverting said container to a second position to bring the first electrolyte inside said container into contact with said parts of said connectors not to be coated,

immersing the parts to be coated at least partially in a second electrolyte of the coating material which is electrically joined to an electrode to be connected to a current source, and

connecting a second electrode of said current source to said first electrolyte.

4,007,098
BATHS AND ADDITIVES FOR THE ELECTRODEPOSITION OF BRIGHT ZINC

William E. Rosenberg, Strongsville, Ohio, assignor to Columbia Chemical Corporation, Cleveland, Ohio

Filed Sept. 4, 1975, Ser. No. 610,251
Int. Cl.² C25D *3/22*
U.S. Cl. 204—55 R **43 Claims**

1. A zinc brightener additive comprising:

from about 99 percent to about 1 percent by weight by a linear aliphatic amine polymer prepared by reacting at a temperature of from about 110° F to about 220° F from about 50 percent to about 150 percent of a stoichiometric amount of an epihalohydrin selected from the group consisting of epichlorohydrin and epibromohydrin and a linear aliphatic polyamine selected from the group consisting of a compound having at least two primary amine groups, two secondary amine groups, or one primary and one secondary amine group, said amine groups separated by two through six methylene groups or alkyl substituted methylene groups, and including from about 1 to about 99 percent by weight of an ethylene oxide condensation product, said product resulting from condensing about 6 to about 30 moles of ethylene oxide with 1 mole of a compound selected from the group consisting of a long chain fatty alcohol, a long chain fatty amine, a long chain fatty acid, a long chain alkyl phenol, wherein said long chains contain from 6 to about 30 carbon atoms, and naphthol.

15. An aqueous, acid zinc electroplating bath for producing a bright electrodeposit of zinc, containing zinc ions, comprising:

having dissolved therein from about 0.5 to 10 grams/liter of an aliphatic amine polymer prepared by reacting from about 50 percent to about 150 percent of a stoichiometric amount of an epihalohydrin selected from the group consisting of epichlorohydrin and epibromohydrin with a linear aliphatic polyamine selected from the group consisting of a compound having at least two primary amine groups, two secondary amine groups, or one primary and one secondary amine group, said amine groups separated by two through six methylene groups or alkyl substituted methylene groups, including from about 1 to about 10 grams/liter of an ethylene oxide condensate product, said ethylene oxide condensation product is formed by condensing at least 6 to about 30 moles of ethylene oxide with 1 mole of a compound selected from the group consisting of a long chain fatty alcohol, a long chain fatty amine, a long chain fatty acid, a long chain alkyl phenol, wherein said long chains have from 6 to about 30 carbon atoms, and naphthol.

4,007,099
CATHODIC PRODUCTION OF MICROPORES IN CHROMIUM

Sidney H. L. Wu, Warrensville Heights, Ohio, assignor to The Harshaw Chemical Company, Cleveland, Ohio

Filed Oct. 8, 1975, Ser. No. 620,511
Int. Cl.² C25D *5/48*
U.S. Cl. 204—140 **10 Claims**

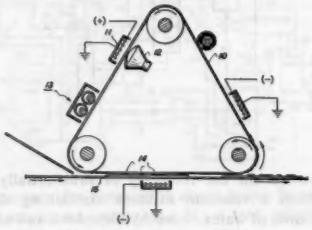
1. A method for the production of micropores in a chromium plate layer from about 0.002 to 0.10 mil thick on a substrate layer, said method comprising

1. immersing said chromium plate layer as a cathode in an electric cell with a non-reactive anode, the electrolyte solution in said cell being an acidic aqueous solution having a pH at least high enough to avoid stripping said chromium plate from said substrate but no greater than 6.0 and containing from 0.5 to 390 grams per liter of hexavalent chromium in a combined state with oxygen and from about 1.5 to about 240 gram-millimoles per gram of hexavalent chromium of oxygen-containing ions of an element selected from the group consisting of sulfur, selenium and tellurium, said electrolyte being maintained in the temperature range of 68° to 195° F.; and
2. introducing current into said cell at the rate of from at least about 0.3 to no greater than 4.5 amperes per square foot of said chromium plate layer exposed to said electrolyte solution for a time period of at least 3 seconds, whereby in said chromium plate layer there are produced micropores in a density of at least 50,000 micropores per square inch as determined by the Dubpernell Test.

4,007,100
PROCESS FOR PREPARATION OF SOLID PHASE DISPERSION OF PHOTOCONDUCTIVE MATERIALS

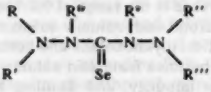
Joseph Y. C. Chu, Fairport, and W. H. H. Gunther, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 454,896, March 26, 1974. This application Jan. 15, 1976, Ser. No. 649,295
Int. Cl.² B01J *1/10;* **G03G** *5/04*
U.S. Cl. 204—158 R **1 Claim**



1. A process for preparation of a solid phase dispersion of inorganic photoconductive materials in an insulating polymeric matrix comprising:

a. forming a polymeric composition from a film forming insulating polymeric resin and at least one organoselenium compound of the formula



wherein R, R′, R″, R‴, R^{iv} and R^{v} are independently selected from hydrogen, alkyl of 1 – 10 carbon atoms, phenyl, substituted phenyl, benzyl and substituted benzyl; and

subjecting said polymeric composition to sufficient energy to decompose said selenium compound whereby elemental selenium is deposited within the organic polymeric composition in substantial conformity with the distribution of said energy throughout the composition.

4,007,101
PROCESS FOR PREPARATION OF SOLID PHASE DISPERSION OF PHOTOCONDUCTIVE MATERIALS

Joseph Y. C. Chu, Fairport, and Wolfgang H. H. Gunther, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

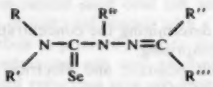
Continuation of Ser. No. 454,896, March 26, 1974. This application Jan. 15, 1976, Ser. No. 649,602

Int. Cl.² B01J *1/10*

U.S. Cl. 204—158 R **1 Claim**

1. A process for preparation of a solid phase dispersion of inorganic photoconductive materials in an insulating polymeric matrix comprising:

a. forming a polymeric composition from a film forming insulating polymeric resin and at least one organoselenium compound of the formula



wherein

R, R′, R″, R‴ and R^{iv} are independently selected from hydrogen, alkyl of 1 - 10 carbon atoms, phenyl, substituted phenyl, benzyl, and substituted benzyl; and

b. subjecting said polymeric composition to sufficient energy to decompose said selenium compound; whereby elemental selenium is deposited in the organic polymeric composition in substantial conformity with the distribution of said energy throughout the composition.

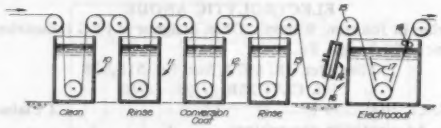
4,007,102
ELECTROCOATING ALUMINUM SHEET OR STRIP

Willard J. Springer, Livermore, and Bruce A. Baker, Jr., Pleasanton, both of Calif., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Continuation-in-part of Ser. No. 431,853, Jan. 9, 1974, Pat. No. 3,864,230. This application Dec. 12, 1974, Ser. No. 532,116

Int. Cl.² C25D *13/16, 13/20*

U.S. Cl. 204—181 **5 Claims**



1. In the method of coating continuous lengths of aluminum sheet or strip which can be subjected to severe deformation in subsequent fabrication steps wherein said sheet or strip is cleaned, treated to form thereon a chemical conversion coating, coated with a primer coat and then coated with a top coat, the improvement comprising forming said chemical conversion coating by treating said sheet or strip for not more than 30 seconds with an acidic aqueous solution containing hexavalent chromium, phosphate and fluoride so as to form thereon from about 10–100 Mg/ft² (108–1080 Mg/m²) of a chromium phosphate conversion coating, applying the primer coat by electrocoating a water-based polyelectrolyte resin onto the sheet or strip, applying the top coat in a suitable fashion onto the electrocoated resin and then curing both the electrocoated resin primer coat and the top coat in a single curing step.

4,007,103
PLANARIZING INSULATIVE LAYERS BY RESPUTTERING

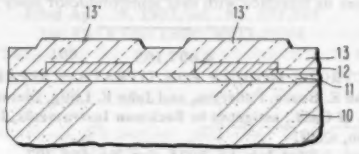
Theodore Harris Baker, Wappingers Falls; Majid Ghafghaichi, Poughkeepsie; Richard Charles Stevens, Poughkeepsie, and Hans Wimpfheimer, Poughkeepsie, all of N.Y., assignors to IBM Corporation, Armonk, N.Y.

Filed Oct. 14, 1975, Ser. No. 621,899

The portion of the term of this patent subsequent to Sept. 28, 1993, has been disclaimed.

Int. Cl.² C23C *15/00*

U.S. Cl. 204—192 **10 Claims**



1. A method of forming a planar electrically insulative layer over a non-planar integrated circuit substrate having raised portions comprising

forming a plurality of recesses in a silicon substrate,

forming over said substrate, an electrically insulative layer whereby said layer has elevations corresponding to the underlying unrecessed portions of said substrate,

forming on said electrically insulative layer a masking layer of photoresist material having at least one opening therethrough coincident with an elevation in said insulative layer, said opening having smaller lateral dimensions than said coincident elevation,

etching to planarize the portion of said elevation exposed in said opening to the level of the unelevated portions of said insulative layer,

removing said masking layer, and

resputtering said deposited insulative layer for a period of time sufficient to planarize the remainder of said etched elevation to the level of the unelevated portions of said insulative layer.

4,007,104
MESA FABRICATION PROCESS

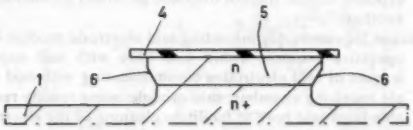
John Gilbert Summers, Crowborough; Michael John Josh, Reilate, and Mildred Avis Ayling, Salfords, all of England, assignors to U.S. Philips Corporation, NY, N.Y.

Filed Oct. 22, 1975, Ser. No. 624,724

Claims priority, application United Kingdom, Oct. 29, 1974, 46726/74

Int. Cl.² C23C *15/00*

U.S. Cl. 204—192 **7 Claims**



1. A method of manufacturing a semiconductor device comprising:

a. providing a semiconductor layer of one conductivity type on a semiconductor body portion of the same conductivity type but higher conductivity,

b. forming an etch-masking layer on part of the semiconductor layer surface, and

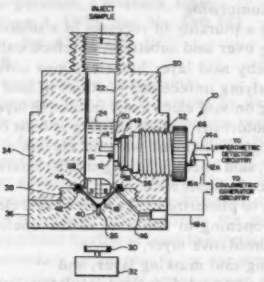
c. subjecting the semiconductor layer surface to an etching treatment in a gas plasma to etch through the semiconductor layer where exposed around said etch-masking layer and so leave a mesa portion of the semiconductor layer under said etch-masking layer and expose the part of said semiconductor body portion around said mesa portion, and, while using the etch-masking layer to mask the top of said mesa-portion, subjecting the exposed parts of said semiconductor body portion and said mesa portion to further etching which includes removing the material of said semiconductor body portion faster than that of said semiconductor layer to etch under said mesa portion of the semiconductor layer and cause the whole upper edge of said mesa portion to overhang the adjacent etched surface, the side of said mesa portion being bevelled by the further etching so that the area of the resulting mesa portion of the semiconductor layer increases from its interface with said semiconductor body portion.

4,007,105

ELECTRODE MODULE FOR TITRATION APPARATUS

Edmund E. Buzza, Fullerton, and John E. Lillig, Diamond Bar, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed July 11, 1975, Ser. No. 595,207
Int. Cl.² G01N *27/44*
U.S. Cl. 204—195 T **10 Claims**



1. In titration apparatus of the type including an analysis cell having a chamber for receiving a sample to be analyzed, a coulometric generator anode and cathode electrode pair operative to generate ions combinable with a constituent of said sample, an amperometric detector anode and cathode electrode pair operative to detect the presence of uncombined ions after complete ionic combination of said constituent, the improvement comprising:

a bore communicating with said sample receiving chamber through a wall thereof;

an electrode module supporting said amperometric anode, said amperometric cathode, and said coulometric cathode in a fixed relationship, the electrodes of said electrode module being generally rod-shaped and having exposed lengths thereof disposed generally parallel to one another;

means for removably mounting said electrode module in an operative position within said bore with said exposed lengths of said electrodes communicating with said sample receiving chamber, said module being readily removable from said bore to facilitate cleaning of the electrodes thereof;

means for independently mounting said coulometric anode in operative position within said analysis cell; and

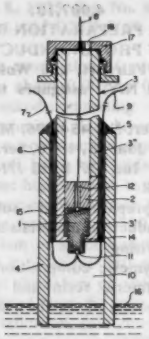
wherein the exposed length of said amperometric cathode is longer than the exposed lengths of remaining ones of said electrodes to maximize collection of uncombined ions at said amperometric cathode.

4,007,106

DEVICE FOR MEASURING OXYGEN CONCENTRATION IN MOLTEN-METAL

Michel Hone, St. Placide, Canada, and Serge Houot, Lambersart, France, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Continuation-in-part of Ser. No. 449,994, March 11, 1974, abandoned. This application Aug. 18, 1975, Ser. No. 607,195
Claims priority, application Canada, June 22, 1973, 174777
Int. Cl.² G01N *27/46*
U.S. Cl. 204—195 S **7 Claims**



1. A probe for determining the concentration of oxygen in a molten metal comprising:

a thermal shock resistant and electrical insulating tube having first and second ends;

a solid electrolyte loosely mounted at the second end of the tube to allow an inert gas injected into the first end of the tube to flow between the tube wall and the electrolyte, out of the second end of the tube, the tube and the electrolyte being adapted to fuse to form a gas tight seal when the probe is lowered into the molten metal;

cavity means located at the second end of the tube containing sufficient inert gas to prevent the actual contact between the electrolyte and the molten metal as the probe is lowered into the molten metal; and

a solid oxygen reference located within the tube in contact with the electrolyte and a pair of electrodes mounted across the electrolyte by which the emf across the electrolyte is detected.

4,007,107

ELECTROLYTIC ANODE

Harlan B. Johnson, Rittman, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 18, 1974, Ser. No. 515,938
Int. Cl.² C25B *11/06, 11/10*
U.S. Cl. 204—290 F **2 Claims**

1. An electrode comprising:

an electroconductive substrate; and

and electroconductive surface on said substrate consisting essentially of a congruently melting compound chosen from the group consisting of RuTi, RuV, Ru_2Zr, NbRu, RuTa, Mo_3Ru_2, W_3Ru_2, $RuCr_2$, Rh_3Ti, Rh_3V, Rh_2Zr, Rh_3Nb, Rh_3Ta, $RhCr_2$, OsTi, OsV, OsZr, Nb_2Os_2, $Mo_{19.5}Os_{10.5}$, Ta_2Os, WOs_2, Cr_2Os, $TiIr_2$, VIr_2, $ZrIr_2$, Ir_3Nb, Mo_2Ir, TaIr, HfIrNi, Cr_3Ir, Mn_3Ir, Pt_3Ti, Pt_3V, Pt_2Zr, Pt_3Nb, Pt_3Mo, Pt_4Ta, $PtCr_2$, Re_2V, Re_2Zr, NbRe, MoRe, TaRe, WRe, Re_2Fe_3, CrRe, Mn_2Re_3, $TiPd_3$, Pd_2V, Pd_2Zr, PdTa, Pd_2Mn_3, and mixtures thereof.

4,007,108
CONVERTING SOLID FUELS TO GASEOUS AND LIQUID FUELS

Arnold Marcel Leas, P.O. Box 429, Columbia City, Ind. 46725

Filed June 2, 1975, Ser. No. 583,336
Int. Cl.² G10G *1/08*
U.S. Cl. 208—10 13 Claims

1. A process for the production of liquid and gaseous fuels from coal which comprises

admixing crushed coal with cobalt tetroxide catalyst;

introducing said mixture into a coal-oil extractor with hydrogen;

extracting liquids and gases from said coal while partially hydrogenating same at a temperature of from about 500° to about 900° F;

removing gaseous and vaporized liquids, desulfurizing and recovering as products;

removing the coal, oil and catalyst to a high pressure hydrogenator and hydrogenating the mixture at pressures of from about 500 to about 5,000 psig;

removing the hydrogenated oil, coal ash and catalyst to a coal reactor having upper middle, and lower zones;

admixing therewith hot sand, at a temperature of from about 800° to about 1,600° F;

cracking said oils in the upper zone of said coal reactor as the admixture flows downward through said coal reactor;

removing vaporized light oils to the coal-oil extractor;

reacting carbon-coated sand coal ash and catalyst in the middle zone of said coal reactor with a source of oxygen to gasify carbon to primarily carbon monoxide;

removing decarbonized ash and catalyst to a separator, separating and removing said ash from the system and returning said catalyst to the coal extractor;

feeding cobalt tetroxide and steam to the lower zone of the coal reactor, converting residual carbon and carbon monoxide to carbon dioxide;

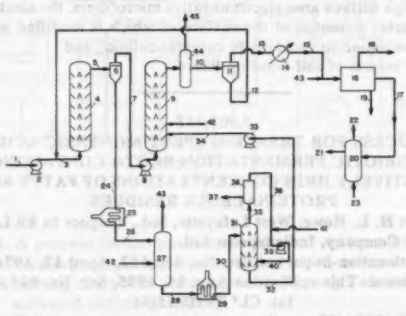
removing said sand and cobalt from the lower zone to a separator, regenerating cobalt metal with air, and returning said sand and cobalt tetroxide to the coal reactor in a cyclic, continuous process;

removing hot producer gas from the middle zone of the reactor, desulfurizing and recovering as product.

4,007,109
COMBINED DESULFURIZATION AND HYDROCONVERSION WITH ALKALI METAL OXIDES

William C. Baird, Jr., and Roby Bearden, Jr., both of Baton Rouge, La., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Apr. 28, 1975, Ser. No. 571,911
Int. Cl.² C10G *13/06;* B01J *27/04*
U.S. Cl. 208—108 12 Claims

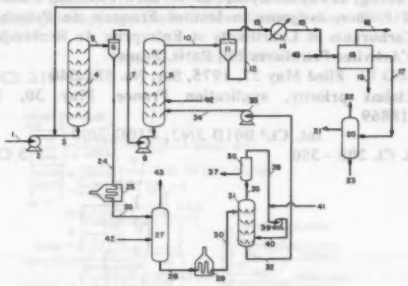


1. A process for the combined desulfurization and hydroconversion of a sulfur-containing heavy hydrocarbon feedback containing at least about 10 weight percent materials boiling above about 1,050° F, which comprises contacting said hydrocarbon feedstock, while in the liquid phase, with an alkali metal oxide in a conversion zone, in the presence of sufficient added hydrogen to product a hydrogen pressure of from about 1,000 to 5,000 psig, said conversion zone being maintained at elevated temperatures ranging from about 750° to 2,000° F, so that the sulfur content of said heavy hydrocarbon feedstock is substantially reduced and said hydrocarbon feedstock is simultaneously subjected to hydroconversion such that the 1,050° F+ fraction thereof is converted to lower-boiling products.

4,007,110
RESIDUA DESULFURIZATION WITH SODIUM OXIDE AND HYDROGEN

Roby Bearden, Jr., Baton Rouge, La., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Apr. 28, 1975, Ser. No. 571,917
Int. Cl.² C10G *13/06;* B01J *27/04*
U.S. Cl. 208—108 12 Claims

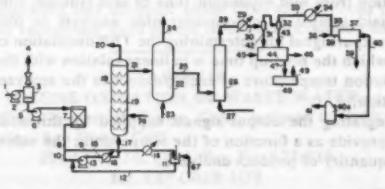


1. A process for desulfurizing a sulfur-containing heavy hydrocarbon feedstock containing at least about 10 weight % materials boiling above about 1050° F, which comprises contacting said hydrocarbon feedstock, substantially in a liquid phase, with sodium oxide in a conversion zone, in the presence of hydrogen maintained at a pressure of between about 50 and 1000 psig, so that the sulfur content of said heavy hydrocarbon feedstock is substantially reduced.

4,007,111
RESIDUA DESULFURIZATION AND HYDROCONVERSION WITH SODAMIDE AND HYDROGEN

William Chalmers Baird, Jr., Baton Rouge, La., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Apr. 28, 1975, Ser. No. 571,946
Int. Cl.² C10G *13/06;* B01J *27/24*
U.S. Cl. 208—108 19 Claims



1. A process for the simultaneous desulfurization and hydroconversion of a sulfur-containing petroleum oil feedstock, which comprises contacting said feedstock with sodamide in a

reaction zone, in the presence of added hydrogen, said feedstock being maintained substantially in the liquid phase, to form an oil phase having a reduced sulfur and metals content, and reduced Conradson carbon content, and a salt phase.

4,007,112

METHOD OF CONTROLLING A DISTILLATION COLUMN FOR TOPPING CRUDE PETROLEUM

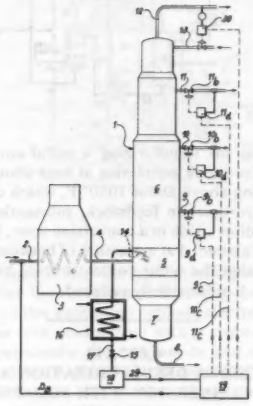
Guy Benker, Melun; Bernard Louvel, Versailles; Dominique Tauszig, St Foy les Lyon, and Bernard Vourron, Oullins, all of France, assignors to Institut Francais du Petrole, des Carburants et Lubrifiants et Entreprise de Recherches et d'Activites Petrolieres Elf, Paris, France

Filed May 27, 1975, Ser. No. 581,346

Claims priority, application France, May 30, 1974, 74.18869

Int. Cl.² B01D *3/42*; **C10G** *7/00*

U.S. Cl. 208—350 **3 Claims**



1. A method of controlling a distillation column having expansion and distillation zones for topping crude petroleum comprising introducing the crude petroleum into the expansion zone of the column to obtain a vaporized fraction having a known yield,

withdrawing a representative sample of the vaporized fraction from said expansion zone of said column, subjecting said sample to chromatographic analysis to obtain an output signal for determining the TBP distillation curve in which the hold-up time is in linear relation with the distillation temperature of each product in the analyzed fraction,

integrating the output signals supplied by the analysis to provide as a function of the temperature the value of the quantity of product analyzed,

and

using the information provided by said analysis for operating a control unit for generating signals for adjusting the rates of withdrawal of products at different predetermined levels of the distillation zone.

4,007,113

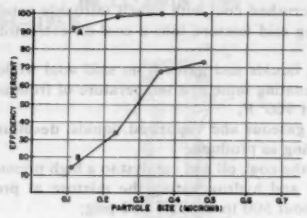
PARTICULATE FILTER MEDIUM AND PROCESS

Eugene A. Ostreicher, Farmington, Conn., assignor to AMF Incorporated, White Plains, N.Y.

Continuation-in-part of Ser. No. 358,822, May 9, 1973, abandoned. This application July 22, 1975, Ser. No. 598,097

Int. Cl.² B01D *13/00*

U.S. Cl. 210—23 R **5 Claims**



1. An improved filter medium consisting essentially of a matrix of self-bonding fibers, and diatomaceous earth, the surface of which is modified with melamine-formaldehyde cationic colloid.

4,007,114

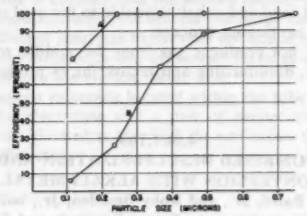
FIBROUS FILTER MEDIUM AND PROCESS

Eugene A. Ostreicher, Farmington, Conn., assignor to AMF Incorporated, White Plains, N.Y.

Continuation-in-part of Ser. No. 358,822, May 9, 1973, abandoned. This application July 22, 1975, Ser. No. 597,931

Int. Cl.² B01D *13/00*

U.S. Cl. 210—23 R **3 Claims**



1. An improved filter medium of enhanced electrokinetic capture potential for contaminated liquids comprising suspended electronegative particles of about 0.1 to 0.7 micron diameter, said filter medium consisting essentially of

1. high surface area electronegative microfibers, the electric (zeta) potential of the surface of which is modified with melamine-formaldehyde cationic colloid; and
2. a matrix of self-bonding fibers.

4,007,115

PROCESS FOR TREATING SPENT MONENSIC ACID ANTIBIOTIC FERMENTATION BROTH CONTAINING RELATIVELY HIGH CONCENTRATIONS OF FATTY AND PROTEINACEOUS RESIDUES

Robert H. L. Howe, West Lafayette, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 460,642, April 12, 1974, abandoned. This application Aug. 15, 1975, Ser. No. 605,085

Int. Cl.² B01D *15/04*

U.S. Cl. 210—27 **7 Claims**

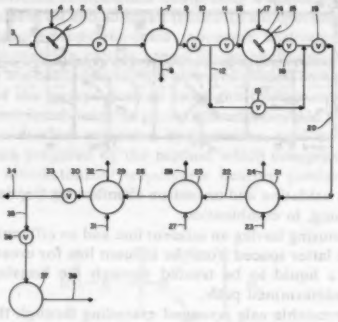
1. A process for treating spent monensic acid antibiotic fermetation broth containing concentrations of from about 0.3 to about 12 percent fat and residues thereof and from

about 1.5 to about 9.5 percent protein and residues thereof comprising:

a. acidifying the spent antibiotic fermentation broth to a pH of from about 3.0 to about 5.0;

b. passing the acidified broth from step a) through a coalescing strainer wherein coalesced fat particles resulting from said acidification are impinged on a plate or screen disposed in such strainer, and removed from said broth;

c. basifying the broth discharged from the coalescing strainer of step b) to a pH of from about 8.0 to about 9.0;



d. passing the basified broth of step c) through a filtering means to remove coalesced protein materials formed in step c);

e. passing the filtrate from the filtering means of step d) through an anion exchange column to remove the residual fatty materials from such filtrate; and

f. passing the effluent from the anion exchange column of step e) through a cation exchange column to remove the residual proteinaceous material from such effluent.

4,007,116

PROCESS FOR THE PURIFICATION OF WASTE WATERS WITH ACTIVATED CARBON

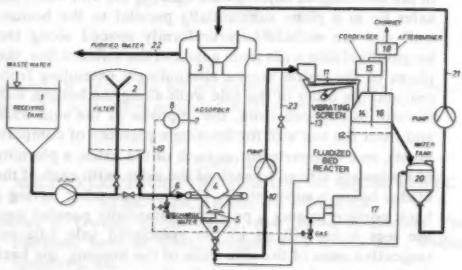
Günther Gappa, Gelsenkirchen-Buer; Harald Juntgen, Essen; Jürgen Klein, Essen, and Jürgen Reichenberger, Essen, all of Germany, assignors to Bergwerksverband GmbH, Essen, Germany

Filed July 23, 1975, Ser. No. 598,385

Claims priority, application Germany, July 31, 1974, 2436792

Int. Cl.² B01D *15/00*

U.S. Cl. 210—33 **12 Claims**



1. A process for the purification of waste water containing dissolved organic carbon contaminants which comprises

a. passing the waste water upwardly through a column of activated carbon particles,

b. distributing the waste water equally over the entire cross-sectional area of the column of carbon particles,

c. determining the total organic carbon content of the water before it enters the column and simultaneously at a location that is between 30 and 70% of the total height of the carbon particles in the column,

d. continuously withdrawing spent carbon particles from the bottom of the column at such a rate as to maintain an essentially constant preselected difference between the total organic carbon content of the water as it enters the column and at the preselected location that is between 30 and 70% of the height of the carbon particles in the column,

e. continuously introducing fresh activated carbon particles or reactivated carbon particles at the top of the column at such a rate as to compensate for those withdrawn at the bottom of the column, and

f. recovering the thus-purified water at the top of the column.

4,007,117

METHODS OF RECOVERING WOOL GREASE FROM SPENT WOOL SCOURING LIQUOR

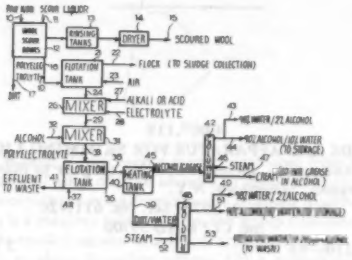
Donald Kenneth Smith, London, England, and Corran Norman Stuart McLachlan, Eastbourne, New Zealand, assignors to New Zealand Inventions Development Authority, Wellington, New Zealand

Filed Nov. 20, 1974, Ser. No. 525,631

Claims priority, application New Zealand, Nov. 21, 1973, 172664

Int. Cl.² C11B *11/00*

U.S. Cl. 210—44 **10 Claims**



1. In a method of treating spent wool scour liquor containing wool grease comprising settling out solid dirt particles and flocculating out suspended particles by adding a polyelectrolyte flocculant in a floatation tank, the improvement which comprises:

a. adjusting the pH of said liquor to at least 8,

b. adding an aliphatic or cyclic alcohol having between four and eight carbon atoms in a quantity greater than that required to saturate said liquor and adding sufficient additional cationic or non-ionic organic polyelectrolyte flocculant to produce a concentration of 2–20 ppm weight/weight in said liquor,

c. mixing said alcohol, flocculant and liquor at a temperature at least as high as ambient until substantially all of said wool grease is taken up by said alcohol,

d. discontinuing said mixing to allow distinct alcoholic and aqueous phases to be formed, and

e. separating said alcoholic phase from said aqueous phase and recovering wool grease from said alcoholic phase.

4,007,118

OZONE OXIDATION OF WASTE WATER

David Fred Ciambrone, Santee, Calif., assignor to Cubic Corporation, San Diego, Calif.

Filed Oct. 16, 1975, Ser. No. 622,816

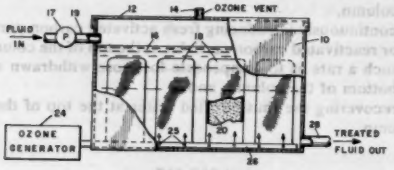
Int. Cl.² C02B *1/38*

U.S. Cl. 210—63 Z **6 Claims**

1. A method of ozone oxidation of waste water containing organic contaminants and bacteria comprising the steps of:

injecting the waste water into a closed tank,

submerging fluid pervious bags with powdered transition metal oxide catalyst therein into the tank substantially filled with the waste water for oxidizing with ozone,
restraining the catalyst in said fluid pervious bags,
said catalyst being selected from a group consisting of manganese trioxide, ferric oxide, nickel oxide and copper oxide,



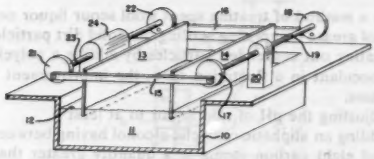
injecting ozone from a source of ozone into said bags in the waste water for exposure to said catalyst and for reacting with and rendering the waste water flowing through said bags, purified and inert,
drawing the purified water out of the tank,
and venting the ozone out of the upper portion of the tank.

4,007,119

METHODS AND APPARATUS FOR SKIMMING LIQUIDS

John N. Antonevich, Jamestown, N.Y., assignor to Blackstone Corporation, Jamestown, N.Y.

Filed Sept. 9, 1975, Ser. No. 611,720
Int. Cl.² B01D *37/00*
U.S. Cl. 210—65 2 Claims



1. A method of surface skimming liquids such as molten solder comprising the steps of:
   a. breaking the surface at two spaced parallel confining boundaries;
   b. moving the confined surface unidirectionally;
   c. removing the confining boundaries; and
   d. continuously repeating steps (a) through (c), said surface being broken by inserting a pair of spaced parallel blades which are moved in synchronism across the surface, removed, returned to their entry point and reinserted in the liquid in cyclic fashion.

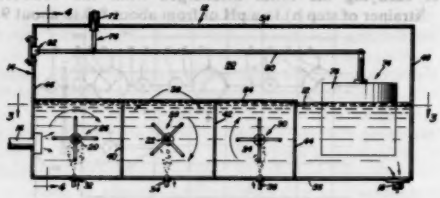
2. An apparatus for skimming liquids in a confining pot comprising a pair of spaced parallel blades and means cyclically and synchronously driving said blades simultaneously to enter said liquid through the top surface in parallel, move across said liquid with a portion of the surface confined therebetween and rise from the surface at a point spaced from their entry a pair of spaced parallel shafts journalled adjacent the confining pot, cranks on each end of each shaft, crank arms interconnecting the cranks on each end of said shafts, said spaced parallel blades mounted on said crank arms and drive means synchronously driving said shafts.

4,007,120

OXIDATION AND OZONATION CHAMBER

James H. Bowen, MacClenny, Fla., assignor to BDH, Inc.(Entire), Rome, Ga.

Continuation-in-part of Ser. No. 539,908, Jan. 9, 1975, abandoned. This application July 17, 1975, Ser. No. 596,892
Int. Cl.² C02B *3/08;* C02C *5/04*
U.S. Cl. 210—120 5 Claims



1. An oxidation and ozonation chamber for treating a liquid, comprising, in combination:
   a. a housing having an influent line and an effluent line, with the latter spaced from the influent line for creating a flow of a liquid to be treated through the housing along a predetermined path;
   b. a rotatable axle arranged extending through the housing transverse to a path directly between the influent line and the effluent line of the housing;
   c. a blade affixed to the axle for rotation therewith and agitating the liquid in order to form an electrostatic charge thereon and to mix oxygen and ozone with the liquid; and
   d. separate injecting means connected to the bottom of the housing for injecting and directing a flow of at least one of oxygen and ozone into the housing and toward the blade, for combining the electrostatic charge formed on the blade to create ozone in the present of a flow of oxygen, a plurality of axles are journalled in substantially parallel relationship transverse of the direct line between the influent line and the effluent line, and further including baffle means including a plurality of planar, substantially parallel plates disposed alternating with and substantially parallel to the axles for creating a tortuous flow by the axles between the influent line and effluent line of the housing, the housing being substantially rectangular in configuration and has a pair of end walls, longitudinal side walls, and top and bottom walls, the walls being joined to one another to form an enclosure, with the influent line being disposed in one of the end walls adjacent the bottom wall, and the effluent line being disposed in the bottom wall adjacent the other of the end walls, the axles lie in a plane substantially parallel to the bottom wall and are substantially uniformly spaced along the longitudinal side walls from adjacent the influent line, the plates of the baffle means alternatingly extending from one and the other of the side walls along the bottom wall toward, but spaced from, the opposite of the side walls and from the top wall for forming a plurality of compartments, one compartment to each of the axles, a plurality of blades are affixed to each of the axles, with each of the blades being a substantially U-shaped member having a back portion joining a pair of substantially parallel legs, the legs being affixed to the associated axle adjacent respective ones of the side walls of the housing, the back portion extending substantially the entire longitudinal extent of the associated axle, a normally open vent is provided in the top wall of the housing, and further including a float valve mounted on the housing and having a valve element arranged for effectively blocking the vent increasing the pressure within the housing and thus increasing the flow of liquid out the effluent line from the housing whenever the liquid in the housing reaches a predetermined level.

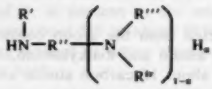
4,007,121

LUBRICATING OIL COMPOSITIONS CONTAINING A DISPERSANT AMOUNT OF AMINATED NITROKETONIZED HYDROCARBON TERPOLYMERS

Charles B. Holder, Wappingers Falls; Richard F. Love, and Donald R. Lachowicz, both of Fishkill, all of N.Y., assignors to Texaco Inc., New York, N.Y.

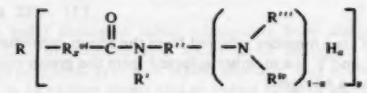
Filed June 3, 1974, Ser. No. 475,531
Int. Cl.² C10M 1/32
U.S. Cl. 252—51.5 A 14 Claims

1. A lubricant composition comprising a major proportion of a lubricating oil and admixed therewith a dispersing amount of an ethylene-propylene-third monomer hydrocarbon terpolymer containing carbon atoms in the backbone and pendant from the backbone carbon atoms of at least some but less than all of the groups derived from the third monomer, an N-hydrocarbylcarbonamide group spaced from said backbone chain by a divalent saturated hydrocarbon, said terpolymer having been prepared by the method which comprises reacting (i) a nitroketonized terpolymer bearing pendant alpha nitroketone groups with (ii) an amine

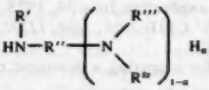


wherein R′, R‴ and R^{iv} are hydrogen or saturated hydrocarbon, R″ is divalent saturated hydrocarbon and *a* is 0 or 1.

14. A concentrate containing in 20–80 parts of inert-diluent solvent 10–70 parts of an amide terpolymer



wherein R is a terpolymer residue of an ethylene-propylene-third monomer hydrocarbon terpolymer, R′, R‴, and R^{iv} are hydrogen or saturated hydrocarbon, R″ and R^{vi} are divalent saturated hydrocarbon, $y = 1–100$, *a* is 0 or 1, and *x* is 1, said terpolymer having been prepared by the method which comprises reacting (i) a nitroketonized terpolymer bearing pendant alpha nitroketone groups with (ii) an amine



wherein R′, R‴, and R^{iv} are hydrogen or saturated hydrocarbon, R″ is divalent saturated hydrocarbon and *a* is 0 or 1.

4,007,122

SOLID ELECTROLYTES FOR USE IN SOLID STATE ELECTROCHEMICAL DEVICES

Boone B. Owens, Apple Valley, and Hilton J. Hanson, Farmington, both of Minn., assignors to Gould Inc., Rolling Meadows, Ill.

Continuation-in-part of Ser. No. 465,432, April 29, 1974, abandoned. This application Apr. 28, 1975, Ser. No. 571,953
Int. Cl.² H01G 1/00; H01M 6/06
U.S. Cl. 252—62.2 10 Claims

1. A solid electrolyte material for a solid state electrochemical device consisting essentially of a composition of a lithium halide, an oxide selected from the group consisting of SiO_2, Al_2O_3, and mixtures thereof and water, the lithium halide being present in an amount of from about 50 to about 90 mole percent, based upon the total moles of lithium halide and the oxide, and the water being present in an amount of at least about 0.5 weight percent, based upon the total weight of the composition but in an amount insufficient to impair the performance of the solid electrolyte material.

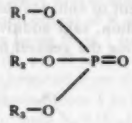
4,007,123

FIRE RESISTANT FUNCTIONAL FLUID COMPOSITIONS

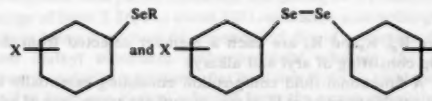
Martin B. Sheratte, Canoga Park, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Continuation-in-part of Ser. No. 230,131, Feb. 28, 1972, abandoned, and a continuation-in-part of Ser. No. 449,623, March 11, 1974, Pat. No. 3,935,116. This application Oct. 15, 1974, Ser. No. 514,389
The portion of the term of this patent subsequent to Feb. 11, 1992, has been disclaimed.
Int. Cl.² C10M 3/40, 3/32
U.S. Cl. 252—78.5 25 Claims

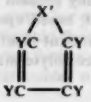
1. A functional fluid composition consisting essentially of (1) a phosphorus compound selected from the group consisting of phosphate esters and mixtures of said phosphate esters, said phosphate esters having the general formula:



where R_1 and R_2 are each a member selected from the group consisting of alkyl of from about 3 to about 10 carbon atoms, and alkoxyalkyl having from about 3 to about 8 carbon atoms, and R_3 is a member selected from the group consisting of alkyl and alkoxyalkyl, as above defined, aryl and alkaryl, containing from 6 to about 8 carbon atoms, (2) a polyalkylene glycol material, said glycol material selected from the group consisting of a polypropylene glycol mono- or diether, and a mono- or diether of an ethylene-propylene copolymer, said mono- or diethers having at least one terminal oxyalkyl group wherein the alkyl radicals contain from 1 to about 4 carbon atoms, and mixtures thereof, said polyalkylene glycol material having a molecular weight ranging from about 500 to about 2,000, said phosphorus compound being present in an amount ranging from about 15 to about 90%, and said glycol material being present in an amount ranging from about 9 to about 84%, by weight of said composition, said phosphorus compound and said glycol material being present in amounts such that said composition has a viscosity at −65° F of not greater than about 6,000 centistokes, and a viscosity at 210° F of not less than 2.25 centistokes, and (3) a small amount of an additive compound sufficient to enhance the autoignition temperature of said composition, said additive compound selected from the class (a) having the general formulae:

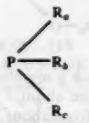


where X is selected from the group consisting of H, alkyl, halogen, alkoxy, amino and dialkylamino, and R is alkyl of from about 1 to about 12 carbon atoms, and (b) having the general formula

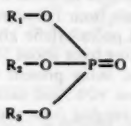


where X′ is a member selected from the group consisting of Se and Te, and Y is a member selected from the group consisting of H and a halogen.

3. A functional fluid composition consisting essentially of (1) a phosphorus compound selected from the group consisting of phosphate esters and amides of an acid of phosphorus, said phosphate esters containing at least two groups selected from the class consisting of alkyl and alkoxyalkyl, and mixtures of said phosphate esters, (2) a polyalkylene glycol material having terminal groups selected from the class consisting of free hydroxyl and ether groups, said ether groups being oxyalkyl groups wherein the alkyl radicals contain from 1 to about 8 carbon atoms, and mixtures of said glycol material, said alkylene groups being selected from the class consisting of ethylene and propylene radicals, and mixtures thereof, said polyalkylene glycol material having a molecular weight ranging from about 500 to about 25,000, said phosphorus compound and said glycol material being present in amounts such that said composition has a viscosity at −65° F of not greater than about 6,000 centistokes, and a viscosity at 210° F of not less than 2.25 centistokes, and (3) a small amount of an additive compound sufficient to enhance the autoignition temperature of said composition, said additive compound selected from the class (a) having the general formulae:



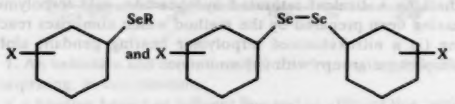
where X is selected from the group consisting of H, alkyl, halogen, alkoxy, amino and dialkylamino, and R is alkyl of from about 1 to about 12 carbon atoms, and (b) having the general formula



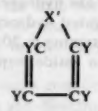
where X′ is a member selected from the group consisting of Se and Te, and Y is a member selected from the group consisting of H and a halogen, and (4) a small amount of a tertiary organic phosphine having the formula:

where R_a, R_b and R_c are each a member selected from the group consisting of aryl and alkaryl.

6. A functional fluid composition consisting essentially of (1) a combination of at least two phosphate esters, one of said phosphate esters containing at least two groups selected from the class consisting of alkyl and alkoxyalkyl, and mixtures thereof, and a second of said phosphate esters containing at least two aromatic groups selected from the class consisting of aryl and alkaryl groups, and mixtures thereof, (2) a combination of at least two polyalkylene glycol ethers containing terminal oxyalkyl groups wherein the alkyl radicals contain from 1 to about 8 carbon atoms, said alkylene groups being selected from the class consisting of ethylene and propylene radicals, one of said polyalkylene glycol ethers having a molecular weight ranging from about 500 to about 2,000, and a second of said polyalkylene glycol ethers having a molecular weight ranging from above 2,000 up to about 25,000, said phosphate esters and said polyalkylene glycol ethers being present in amounts such that said composition has a viscosity at −65° F. of not greater than about 6,000 centistokes, and a viscosity at 210° F. of not less than 2.25 centistokes, and (3) a small amount of an additive compound sufficient to enhance the autoignition temperature of said composition, said additive compound selected from the class (a) having the general formulae:



where X is selected from the group consisting of H, alkyl, halogen, alkoxy, amino and dialkylamino, and R is alkyl of from about 1 to about 12 carbon atoms, and (b) having the general formula



where X′ is a member selected from the group consisting of Se and Te, and Y is a member selected from the group consisting of H and a halogen.

4,007,124

PROCESS FOR PREPARING A SILICATE-PYROPHOSPHATE DETERGENT COMPOSITION

Everett Joshua Collier, and John Edward Morrow, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 550,063, Feb. 14, 1975, abandoned. This application June 30, 1975, Ser. No. 592,010

Int. Cl.² C11D *3/08, 3/14, 11/02, 11/04*

U.S. Cl. 252—109 **19 Claims**

1. A process for preparing a detergent composition comprising:

a. acidifying an aqueous alkali metal silicate with acid, during agitation, thereby forming a silicate premix;

wherein the alkali metal silicate has the formula $\rho\ M_2O \cdot SiO_2$, where M is alkali metal and ρ, the ratio of (mols M_2O) to (mols SiO_2), is from about 0.25 to about 0.50; and

wherein the amount of acid, expressed as a ratio of (equivalents of acid) to (mols SiO_2 in the silicate), is between about 0.0005 and about 0.4;

b. mixing said silicate premix with an aqueous slurry comprised of surfactant, water, and at least one structurant, i.e. structure-forming compound, thereby forming a crutcher mix;

wherein the surfactant is anionic, nonionic, semi-polar, zwitterionic, ampholytic, or mixtures thereof; and

wherein the structurant is selected from the group consisting of calcium carbonate; natural and synthetic clays; nitrilotriacetates; aluminosilicates; and alkali metal pyrophosphates, triphosphates, glassy phosphates, carbonates, bicarbonates, sesquicarbonates,

chlorides, borates, perborates, sulfates, bisulfates, aluminates, and mixtures thereof;

c. drying said crutcher mix to a moisture of from about 0.5% to about 15% by weight of the dried crutcher mix; and

d. adding admixed adjuvant to said dried crutcher mix, thereby forming said detergent composition;

wherein the admixed adjuvant is selected from the group consisting of calcium carbonate; sodium aluminosilicates; alkali metal pyrophosphates, carbonates, borates, bicarbonates and sulfates; water-soluble aminopolycarboxylates; water-soluble salts of phytic acid; water-soluble polyphosphonates; and water-soluble salts of mellitic acid, citric acid, pyromellitic acid, benzene pentacarboxylic acid, oxydiacetic acid, carboxymethyloxysuccinic acid, and oxydisuccinic acid;

wherein percentages of the components by weight, expressed in relation to the final detergent composition, are: SiO_2 in the silicate from about 1.5% to about 16%; surfactant from about 4% to about 50%; structurant from about 4% to about 90%; and admixed adjuvant from 0 to about 80%;

and wherein alkali metal pyrophosphate, $M_xH_yP_2O_7$, where M is alkali metal and x and y are integers having the sum of 4, is present in the composition in an amount from about 5% to about 60%, said pyrophosphate being present as either structurant or admixed adjuvant or both.

4,007,125

SYNTHETIC DETERGENT BAR

Leon M. Prince, Westfield, N.J., assignor to Lever Brothers Company, New York, N.Y.

Filed Dec. 26, 1973, Ser. No. 427,757
Int. Cl.² C11D *10/04*
U.S. Cl. 252—117 **7 Claims**

1. A toilet detergent tablet comprising from about 30 to about 60% of water-soluble alkali metal detergent salts of esters of isethionic acid with mixed aliphatic fatty acids having from 6 to 18 carbon atoms and an iodine value of less than 20, of which mixed acids at least 75% have from 12 to 18 carbon atoms and up to 25% have from 6 to 10 carbon atoms, from 2 to 10% of at least one water-soluble suds-boosting detergent salt selected from the group consisting of alkali metal and organic amine higher aliphatic fatty alcohol sulfates, alkyl aryl sulfonates, and the higher aliphatic fatty acid taurides, from about 1 to about 9% water, from about 2.5 to about 25% of water-soluble higher fatty acid soap, from 10 to 40% of at least one higher fatty acid having from about twelve to about twenty-five carbon atoms as a binder and plasticizer, and as an anti-mushing agent, about 10 to about 20% of sodium alkanesulfonate wherein the alkane group has 12 to 14 carbon atoms, or mixtures thereof, said tablet having improved hardness, improved firmness recovery characteristics, and being substantially free from efflorescence, and having a pH within the range of about 6 to about 8, measured as a 10% aqueous solution of the bar composition at 35° C.

4,007,126

ELECTROPHOTOGRAPHIC MASTER CONVERSION SOLUTION

David A. Wheatland, Cumberland Foreside, Maine, assignor to Scott Paper Company, Philadelphia, Pa.

Filed July 30, 1975, Ser. No. 600,226
Int. Cl.² G03C *5/24;* **G03G** *9/16*
U.S. Cl. 252—182 **2 Claims**

1. A conversion solution for electrophotographic master plates having a zinc oxide containing coating and capable of enhancing the hydrophilic properties of non-imaged portions of the electrophotographic master plate; comprising an acidic, aqueous solution containing a combination of ingredients selected from the group consisting of:

1. phosphate ions in combination with an active amount of triethylenetetramine, and

2. an alkali metal phosphate in combination with an active amount of ethylenediamine.

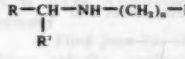
4,007,127

BITUMINOUS CATIONIC EMULSION

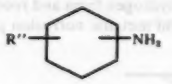
Rene Smadja, and Louis Houizot, both of Notre Dame de Gravenchon, France, assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 16, 1975, Ser. No. 541,533
Int. Cl.² B01J *13/00*
U.S. Cl. 252—311.5 **7 Claims**

1. A bituminous cationic emulsion useful as a binder which comprises (1) from about 50 to about 75 percent by weight of said emulsion of a bitumen, (2) water, (3) a mineral acid, (4) from about 0.005 to about 5 percent by weight of said emulsion of a bitumen soluble N-hydrocarbyl diamine having the formula



wherein R is hydrogen, alkyl, aryl or aralkyl, R′ is alkyl, aryl or aralkyl, the total carbon content of R and R′ being from 4 to 30 carbon atoms and *n* being from 1 to 5, and (5) in amount sufficient to maintain the pH of said emulsion at from 1 to 7, a water soluble amine selected from the group consisting of aliphatic monoamine having from 1 to 9 carbon atoms, alkylene polyamine of the formula $H_2N(C_nH_{2n}NH)_r—H$, wherein M is 1 to 3 and *r* is 1 to 3; and an aromatic amine of the formula



wherein R″ is hydrogen or alkyl of 1 to 3 carbon atoms.

4,007,128

POLYAMINE SALTS OF ALUMINUM ALKYL ORTHOPHOSPHATES

Erwin Sigmund Poklacki, Arlington Heights, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Nov. 28, 1975, Ser. No. 636,348
Int. Cl.² B01J *13/00*
U.S. Cl. 252—316 **6 Claims**

1. A gelled hydrocarbon composition comprising a liquid hydrocarbon, a partial aluminum salt of an alkyl acid orthophosphate, said partial aluminum salt having a P/Al ratio in the range of from 2.86/1 to about 10/1, said alkyl acid ortho-phosphate being a mixture of a monoalkyl diacid orthophosphate and dialkyl monoacid orthophosphate wherein the alkyl groups comprise a mixture of at least one C_1 to C_5 alkyl radical and at least one radical selected from the group consisting of C_6 to C_{22} alkyl radicals and C_6 to C_{22} alkenyl radicals, and a neutralizing amount of a polyamine compound selected from the group consisting of ethylene diamine, diethylene triamine, triethylene tetramine, tetraethylene pentamine, polyfunctional aromatic amines, and mixtures thereof.

4,007,129

PARTIAL COMBUSTION PROCESS FOR MANUFACTURING A PURIFIED GAS CONTAINING HYDROGEN AND CARBON MONOXIDE

Jaap E. Naber, Amsterdam, and Bernardus H. Mink, The Hague, both of Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Nov. 21, 1974, Ser. No. 525,799

Claims priority, application United Kingdom, Nov. 27, 1973, 54876/73

Int. Cl.² C01B 2/02, 2/14

U.S. Cl. 252—373 12 Claims

1. In a process for manufacturing a hydrogen and carbon monoxide-containing gas by partially combusting a hydrocarbonaceous fuel in a reactor, cooling the crude gas obtained in a waste heat boiler and washing the cooled gas in a scrubber to remove entrained soot particles, the improvement which comprises; washing the crude, cooled gas in a scrubber with an aqueous salt solution containing at least 10%w of an alkaline water-soluble salt, said alkaline water-soluble salt being selected from the group consisting of sodium carbonate, potassium carbonate, sodium phosphate, potassium phosphate and mixtures thereof, which salt solution is subsequently regenerated by removal of absorbed gases and suspended soot and recycled to the scrubber and wherein said gas leaves the scrubber at a temperature of at least about 100° C.

4,007,130

CATALYST REGENERATION METHOD

Harry S. Leach; Thomas C. Singleton, both of Texas City, and Yu Wen Wei, Houston, all of Tex., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 29, 1975, Ser. No. 644,390

Int. Cl.² B01J 23/96

U.S. Cl. 252—411 R 9 Claims

1. A process for the regeneration of a spent catalyst solution comprising the complex reaction product formed from a rhodium or iridium component, an iodine component and carbon monoxide and containing metallic corrosion products which comprises intimately contacting said spent catalyst solution with a cation exchange resin in its hydrogen form and recovering said catalyst solution free of said metallic corrosion products.

4,007,131

HYDROPROCESSING CATALYST REGENERATION

Bernard M. Gillespie, Pitman; Henry R. Ireland, Woodbury, and Thomas R. Stein, Cherry Hill, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

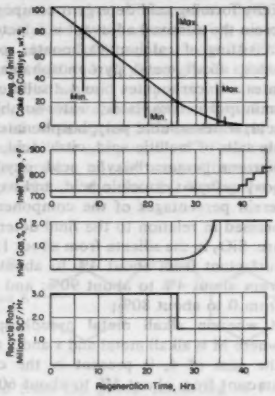
Continuation of Ser. No. 438,158, Jan. 31, 1974, abandoned. This application Sept. 22, 1975, Ser. No. 615,741

Int. Cl.² B01J 29/38, 21/20, 37/14

U.S. Cl. 252—419 5 Claims

1. In the multiple burn method of regenerating coked, deactivated hydrocracking catalyst contained within a reactor, which method comprises preheating a gas stream consisting essentially of about 0.5 volume percent oxygen in a substantially inert gas to an initial temperature of about 650° F, passing said preheated stream into an inlet of said reactor, through said catalyst to be regenerated, and out an outlet of said reactor at a pressure of at least about 100 psig and a space velocity of at least about 50 GHSV, continuing said passing of said preheated stream until the concentration of oxygen at the outlet of said reactor is substantially the same as the concentration at said inlet, whereby completing a first burn, and then increasing said initial temperature of said preheated stream at least once to induce at least a second burn, the improvement, whereby reducing regeneration time and catalyst deterioration, which comprises:

initiating said first burn with said initial temperature increased by 25° to 150° F, said oxygen concentration decreased, and said space velocity increased by an amount sufficient to increase the burning rate, and continuing said passing of said preheated stream until only about 80% of said coke is burned and only until oxygen breakthrough occurs at said outlet of said reactor, and



then increasing further said increased preheat temperature, or increasing said decreased oxygen concentration, or both, thereby removing substantially all the remainder of said coke.

4,007,132

PROCESS FOR THE MANUFACTURE OF A CATALYST

Kurt Rust, Frankfurt am Main; Erwin Schrott, Sulzbach, Taunus; Helmut Strametz, Frankfurt am Main, and Hans-Jürgen Kablitz, Liederbach, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Feb. 27, 1975, Ser. No. 553,810

Claims priority, application Germany, Jan. 30, 1975, 2503708; Jan. 30, 1975, 2503718

Int. Cl.² C08F 4/64

U.S. Cl. 252—429 B 17 Claims

1. In a process for the manufacture of a catalyst which comprises reacting titanium tetrachloride in an inert hydrocarbon solvent with an aluminum-organic compound containing an aluminum dialkyl chloride at a temperature of −20° to +20° C and in a molar proportion of aluminum dialkyl chloride to $TiCl_4$ of 0.8 : 1 to 1.5 : 1, thermally treating the $TiCl_3$-containing reaction product at a temperature of 40° to 150° C, separating and washing the reaction product (component A), and mixing it with an aluminum dialkyl halide (component B), the improvement which comprises effecting a further thermal treatment, of component A, at from 40° to 150° C in the presence of a dialkyl ether and a cyclopolyene in a molar ratio of from 1 : 0.001 to 1 : 0.15 of $TiCl_3$ to cyclopolyene.

7. In a process for the manufacture of a catalyst which comprises reacting titanium tetrachloride in an inert hydrocarbon solvent with an aluminum-organic compound containing an aluminum dialkyl chloride at a temperature of −20° to +20° C and in a molar proportion of aluminum dialkyl chloride to $TiCl_4$ of 0.8 : 1 to 1.5 : 1, thermally treating the $TiCl_3$-containing reaction product at a temperature of 40° to 150° C, separating and washing the reaction product (component A), and mixing it with an aluminum dialkyl halide (component B), the improvement which comprises effecting a further thermal treatment, of component A, at from 40° to 150° C in the presence of a dialkyl ether, and then subjecting component A to an after-treatment with an aluminum alkyl halide at a temperature of from 0° to 60° C in a molar ratio of aluminum alkyl halide to $TiCl_3$ of from 0.8 : 1 to 10 : 1.

4,007,133

PROCESS FOR THE MANUFACTURE OF A CATALYST

Kurt Rust, Frankfurt am Main; Erwin Schrott, Sulzbach, Taunus, and Helmut Strametz, Frankfurt am Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Feb. 27, 1975, Ser. No. 553,813

Claims priority, application Germany, Mar. 20, 1974, 2413261

Int. Cl.² C08F 4/66

U.S. Cl. 252—429 B 10 Claims

1. In the process for the manufacture of a catalyst by reacting titanium tetrachloride in an inert hydrocarbon solvent with an aluminum-organic compound selected from the group consisting of aluminum dialkyl chlorides and aluminum alkyl sesquichlorides wherein the alkyl group contains 1 to 6 carbon atoms, thermally treating the $TiCl_3$-containing reaction product, separating and washing the reaction product (component A) and mixing it with an aluminum dialkyl halide (component B) the improvement which comprises preparing component A by adding said aluminum-organic compound to the $TiCl_4$ at a temperature of from 31 20° to +20° C in a molar proportion of aluminum dialkyl chloride to $TiCl_4$ of from 0.8:1 to 1.5:1, subjecting the $TiCl_3$-containing solid reaction product to a thermal treatment at a temperature of from 40° to 150° C, effecting a further thermal treatment at a temperature of 70° to 150° C in the presence of a dialkyl ether at a $TiCl_3$-ether molar ratio of 1:0.6 to 1:1.2 and separating the solid reaction product.

4,007,134

BEVERAGE CARBONATION DEVICE

Alexander Leon Liepa, Montgomery, and Cornelis Hendrikus Japikse, Springfield Township, Hamilton County, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 445,200, Feb. 25, 1974, abandoned. This application July 17, 1974, Ser. No. 489,292

Int. Cl.² B01J 29/06

U.S. Cl. 252—455 Z 10 Claims

1. A rigid composite body for carbon dioxide adsorption and for subsequent release of said $C0_2$ when said body is brought in contact with water, said body comprising crystalline zeolite molecular sieves in an amount of at least 40% of the body by weight, and a relatively inert binder material, said body having a surface area to mass ratio of from about 4 cm^2/g to about 200 cm^2/g and having at least 6 grams of crystalline zeolite molecular sieves distributed substantially uniformly throughout said body.

5. The body of claim 1 wherein said body has a plurality of substantially parallel elongated channels extending from one surface of said body to the interior of said body with the longitudinal axis of said elongated channels substantially parallel to the axis of the vertical dimension of said body.

4,007,135

PROMOTED SILVER CATALYST FOR PRODUCING ALKYLENE OXIDES

Percy Hayden; Roy John Sampson; Christopher Buxton Spencer, and Harry Pinnegar, all of Billingham, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Nov. 22, 1974, Ser. No. 526,431

Claims priority, application United Kingdom, May 12, 1973, 56369/73; Sept. 1, 1974, 974/74; Sept. 1, 1974, 972/74; Mar. 4, 1974, 14786/74; Mar. 4, 1974, 14787/74; May 24, 1974, 23276/74; May 24, 1974, 23278/74; May 30, 1974, 24071/74; May 30, 1974, 24072/74; Aug. 5, 1974, 34333/74; Aug. 19, 1974, 36357/74; Sept. 19, 1974, 40882/74

Int. Cl.² B01J 23/50, 23/68

U.S. Cl. 252—467 6 Claims

1. A catalyst for producing ethylene or propylene oxide by contacting ethylene or propylene and oxygen with the catalyst, which comprises

a. silver supported on a preformed porous heat resisting support, in which said silver is introduced by impregnating said support with a solution of a decomposable silver compound and decomposing it to silver metal,

b. a promoting amount of sodium, cesium, rubidium, potassium or mixtures thereof, and

c. strontium, calcium, barium or mixtures thereof in a promoting amount,

the amount of components (b) and (c) being in excess of any present in immobile form in the preformed support as impurities or cements.

4,007,136

SUPPORTED CATALYST FOR THE OXIDATION OF O-XYLENE AND/OR NAPHTHALENE TO PHTHALIC ANHYDRIDE

Kurt Blechschmitt, Schifferstadt; Friedrich Wirth; Paul Hornberger, both of Ludwigshafen; Peter Reuter, Bad Duerkheim, and Gert Buerger, Mannheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed June 30, 1975, Ser. No. 591,415

Claims priority, application Germany, July 26, 1974, 2436009

Int. Cl.² B01J 21/06, 23/04, 23/22

U.S. Cl. 252—476 1 Claim

1. A supported catalyst for the oxidation of o-xylene or naphthalene to phthalic anhydride, consisting of an inert nonporous carrier to which has been applied a thin layer of an active material which contains 1 to 40 percent by weight of vanadium pentoxide, and 60 to 98.84 percent by weight of titanium dioxide, and 0.16 to 0.6 percent by weight, based on titanium dioxide, of rubidium in the form of rubidium oxide, and the vanadium pentoxide content, based on supported catalyst, being from 0.05 to 4 percent by weight.

4,007,137

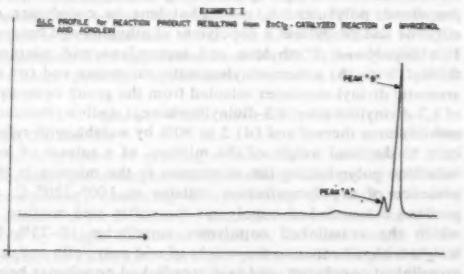
PROCESS FOR PRODUCING MIXTURE CONTAINING 4-(4-METHYL-4-HYDROXYAMYL)Δ^3-CYCLOHEXENECARBOXALDEHYDE, PRODUCT PRODUCED, AND ITS PERFUME USES

James Milton Sanders, Eatontown; William L. Schreiber, Jackson, and John B. Hall, Rumson, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

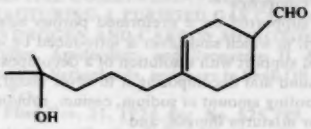
Filed Oct. 7, 1975, Ser. No. 620,354

Int. Cl.² C11B 9/00

U.S. Cl. 252—522 4 Claims

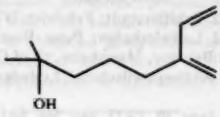

EXAMPLE I
GLC PROFILE for REACTION PRODUCT RESULTING from ZnCl2 - CATALYZED REACTION of MYRCENOL AND ACROLEIN
PEAK "B"
PEAK "A"

1. A process for producing a mixture containing a major proportion of 4-(4-methyl-4-hydroxyamyl)-Δ^3-cyclohexenecarboxaldehyde having the structure:



comprising the step of intimately admixing acrolein having the structure:

with myrcenol having the structure:



i. In the presence of a catalytic quantity of a $ZnCl_2$ catalyst;
ii. At a temperature in the range of from about −20° C up to about 100° C; and
iii. At a pressure of from about 1 atmosphere up to about 100 atmospheres;

the mole ratio of acrolein reactant:myrcenol reactant being in the range of from about 10:1 up to about 1:10; the weight percent of $ZnCl_2$ catalyst based upon the total weight of acrolein reactant and myrcenol reactant being from about 0.2% up to about 10%.

4,007,138

MANUFACTURE OF ION-EXCHANGING SHAPED ARTICLES

Gerhard Kanig, Ludwigshafen, Germany, assignor to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Continuation of Ser. No. 362,233, May 21, 1973, abandoned. This application Mar. 20, 1975, Ser. No. 560,123

Claims priority, application Germany, May 25, 1972, 2225329

The portion of the term of this patent subsequent to Nov. 12, 1991, has been disclaimed.

Int. Cl.² C08F *41/12*

U.S. Cl. 260—2.1 E **16 Claims**

1. A process for the manufacture of ion-exchanging shaped articles which comprises homogeneously mixing (a) a polyolefin selected from the group consisting of polyethylene, polypropylene, polybutene-1, polyisobutylene, a copolymer of ethylene and propylene, a copolymer of ethylene and butene-1, a copolymer of ethylene and isobutylene and mixtures thereof, with (b) a monovinylaromatic monomer and (c) an aromatic divinyl monomer selected from the group consisting of 1,2-divinylbenzene, 1,3-divinylbenzene, 1,4-divinylbenzene and mixtures thereof and (d) 5 to 90% by weight, with reference to the total weight of the mixture, of a solvent of low volatility; polymerizing the monomers in the mixture in the presence of a polymerization initiator at 100°–220° C. to produce a crosslinked copolymer thereof in said mixture in which the crosslinked copolymer constitutes 10–75% by weight with reference to the weight of said polyolefin and said crosslinked copolymer, and said crosslinked copolymer being in the form of minute particles in the matrix of said polyolefin (a), shaping the resulting product into articles in the form of fibers, woven or non-woven fabrics, beads, membranes or sheeting; removing the low-volatility solvent from said articles to provide said articles having micropores; and introducing ion-exchanging groups into the resultant microporous shaped articles.

4,007,139

HIGH RESILIENCY, FLEXIBLE POLYURETHANE FOAMS AND CROSSLINKERS FOR THE PREPARATION THEREOF

Arthur E. Gurgiolo, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 448,165, March 4, 1974, Pat. No. 3,907,721, and a continuation-in-part of Ser. No. 410,138, Oct. 26, 1973, abandoned. This application Jan. 24, 1975, Ser. No. 543,729

Int. Cl.² C08G *18/32, 18/14*

U.S. Cl. 260—2.5 AQ **10 Claims**

1. A flexible polyurethane foam having a resiliency greater than about 50%, a modulus of at least about 2.3 resulting from subjecting to foaming conditions, a composition which comprises

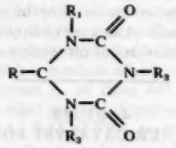
A.
1. from about 50 to 100 parts by weight of a primary, hydroxyl-containing polyether triol having an average hydroxyl equivalent weight of from about 900 to about 2500,
2. from 0 to about 50 parts by weight of a polyol selected from a diol, a triol, a polymer-containing diol, a polymer-containing triol or mixtures thereof wherein said diols and triols have an average hydroxyl equivalent weight of from about 900 to about 2500 and said polymer has an average molecular weight of at least about 5000;

B. an organic polyisocyanate consisting of
1. from about 50 to 100% by weight of 2,4-toluene diisocyanate, 2,6-toluene diisocyanate, NCO-containing prepolymers, thereof or mixtures thereof and
2. from 0 to about 50% by weight of an organic polyisocyanate having an average NCO functionality of at least 2;

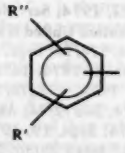
C. from about 1.0 to about 5 parts by weight of water per 100 parts by weight of Component (A);

D. from about 0 to about 20 parts of a low boiling auxiliary blowing agent per 100 parts by weight of Component (A);

E. from about 1 to about 10 parts per 100 parts by weight of Component (A) of a crosslinker composition consisting essentially of
1. from 30 to 100 percent by weight of a primary crosslinker component represented by the general formula

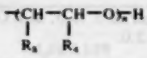


wherein R is a member of the group represented by the formula

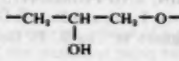


wherein each R' and R'' are independently hydrogen, Cl, Br,

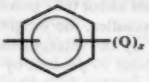
OH or an alkyl group having from 1 to about 6 carbon atoms, each R_1, R_2 and R_3 is independently selected from the formulas



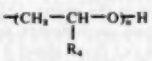
wherein each R_4 is independently hydrogen, phenyl, methyl, ethyl or halomethyl, each R_5 is independently hydrogen or methyl, each n is independently 1, 2 or 3; and



wherein R_6 is selected from the group consisting of allyl, methallyl, or a group represented by the formula



wherein Q is a halogen or an alkyl group and x has a value of 1 when Q is an alkyl group and a value of 1 or 2 when Q is a halogen or x has a value of zero; with the proviso that no more than 2 of the R_1, R_2 and R_3 groups can be represented by the formula



wherein R_4 is hydrogen, methyl or halomethyl;

2. from 0 to about 70 percent by weight of an auxiliary crosslinker component;

F. from about 0.5 to about 4 parts by weight per 100 parts by weight of Component (A) of a catalyst for urethane formation;

G. from about 0.005 to about 1.5 parts by weight per 100 parts by weight of Component (A) of a silicone oil cell control agent;

and wherein Components (A), (B), (C) and (E) are present in quantities so as to provide an NCO:active hydrogen equivalent ratio of from about 0.8:1.0 to about 1.3:1.0.

4,007,140

TERTIARY AMINES AS CATALYSTS IN POLYURETHANE MANUFACTURE

Arthur Ibbotson, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 411,164, Oct. 30, 1973, abandoned. This application Jan. 8, 1975, Ser. No. 539,404

Claims priority, application United Kingdom, Nov. 1, 1972, 50304/72

Int. Cl.² C08G *18/18*

U.S. Cl. 260—2.5 AC **1 Claim**

1. A method for the manufacture of polyurethane which comprises reacting an organic polyisocyanate with an organic polyol in the presence of a catalytically effective amount of N,N'-Bis(3-dimethylaminopropylamino)urea.

4,007,141

OPAQUE, NON-PIGMENTED MICROPOROUS FILM AND PROCESS AND COMPOSITION FOR PREPARING SAME

Marco Wismer, Gibsonia, and Jerome A. Seiner, Pittsburgh, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 632,392, April 20, 1967, abandoned. This application Aug. 21, 1969, Ser. No. 852,055

Int. Cl.² C08J *9/22*

U.S. Cl. 260—2.5 B **9 Claims**

1. A resinous coating composition which upon drying forms a substantially continuous, highly opaque film, said composition comprising:

a. liquid resinous film-forming binder material consisting essentially of at least one film-forming polymer which is substantially non-light absorbing, and

b. dispersed in said binder material, particulate matter comprising discrete solid particles which contain therein one or more cells, the cells in said particulate matter having an average size between about 0.01 micron and about 15 microns, the particle walls having pigment incorporated therein and being composed of a substantially non-opaque material.

4,007,142

AMINE RESIN AND PROCESS

Barry John Clarke, Glenhuntly; Robert William Kershaw, South Blackburn, and Frederick John Lubbeck, Beaumaris, all of Australia, assignors to Balm Paints Limited, Melbourne, Australia

Continuation of Ser. No. 463,786, April 24, 1974, abandoned. This application June 9, 1976, Ser. No. 694,490

Int. Cl.² C08J *9/24*, *9/26*

U.S. Cl. 260—2.5 F **14 Claims**

1. Granules consisting essentially of hard, insoluble amine resin selected from the group consisting of urea-formaldehyde and melamine-formaldehyde resins, said granules having a retiporous structure in that there is spread throughout the granules a net-like web of non-cellular pores or ducts defined by the polymer comprising the granules and further characterized in that the pore volume is from 10–60% of the total granule volume and the pores have an average diameter of about 0.2–0.5 micron, said granules being essentially spheroidal in shape and having an essentially pore-free surface, said granules having a lattice-like structure being built-up by the fusion at random points of contact of neighboring particles.

4,007,143

METHOD OF GRAFTING MONOMERS TO WOOL WITH NITRIC ACID

John Lyndon Garnett, 29 Arabella St., Longueville, New South Wales, Australia (2066), and Robert Sydney Kenyon, 29 Glen St., Eastwood, New South Wales, Australia (2122)

Continuation of Ser. No. 462,331, April 19, 1974, abandoned, which is a continuation of Ser. No. 337,098, March 1, 1973, abandoned. This application June 10, 1975, Ser. No. 585,695

Claims priority, application Australia, Mar. 7, 1972, 8189/72

Int. Cl.² C08L *1/00*, *3/00*, *89/00*

U.S. Cl. 260—8 **9 Claims**

1. A method of grafting a (monomeric substance) vinyl monomer containing sterically available vinyl group onto wool (comprising) consisting of contacting the wool with (the monomer or) a solution (of the monomer) containing at least 30% by weight monomer based on the total weight of the solution in a polar solvent in the presence of a single chemical catalyst, said chemical catalyst being (a mineral acid or an organic acid containing up to 3 carbon atoms) nitric acid, the acid being present in an amount such that the reaction mixture is not more than 0.5N relative to said acid.

4,007,144

THERMOSETTING CELLULOSE ESTER POWDER COATING COMPOSITIONS

Robert R. Sanders; Peter M. Grant, and Robert L. Combs, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 27, 1976, Ser. No. 661,878
Int. Cl.² C08L *1/14*
U.S. Cl. 260—15 **6 Claims**

1. A thermosetting coating composition in the form of a powder having an average particle size of between about 10 and about 300 microns comprising:

a. cellulose acetate butyrate having a butyryl content of about 35 to 55% by weight, a hydroxyl content of about 0.5 to 3.0% by weight, an acetyl content of up to about 15% by weight, and a viscosity of about 0.05 to 1.0 second;

b. about 2 to 15 phr by weight of hexaalkoxymethylmelamine cross-linking agent wherein the alkoxy group contains from 1 to 20 carbon atoms;

c. a catalytic amount of latent acid crosslinking catalyst; and

d. a plasticizing amount of (1) poly(tetramethylene glycol) having a molecular weight of about 650 to 1000, or (2) a poly(alkylene glycol) derived from propylene oxide or propylene oxide and ethylene oxide having a molecular weight of about 700 to 1500 and containing not more than 10 weight percent ethyleneoxy units.

4,007,145

METHOD OF POLYMERIZING CHLOROPRENE USING CONJUGATED LONG-CHAIN FATTY ACIDS AS EMULSIFIERS

Morris S. Edmondson, Alvin, Tex., assignor to Petro-Tex Chemical Corporation, Houston, Tex.

Filed Jan. 10, 1975, Ser. No. 540,279
Int. Cl.² C08L *91/00*
U.S. Cl. 260—23.7 H **17 Claims**

1. In the process of aqueous emulsion polymerization of polymerizable monomer comprising chloroprene and up to 25 weight percent of polymerizable comonomer in the presence of catalyst, modifiers and emulsifiers at a temperature of 0°–90° C wherein the improvement comprises said emulsifier 10 to 100 weight % of a conjugated fatty acid having 10 to 30 carbon atoms and selected from 9, 11-octadecadienoic acid, 9, 11, 13-octadecatrienoic acid or 9, 11, 13, 15-octadecatetraenoic acid.

4,007,146

AQUEOUS INSULATING VARNISHES

Takash: Ishizuka; Shiro Mazaki; Naoki Miwa, and Masatosi Maesoba, all of Ibaraki, Japan, assignors to Nitto Electric Industrial Co., Ltd., Ibaraki, Japan

Filed Feb. 18, 1975, Ser. No. 550,504
Claims priority, application Japan, Feb. 15, 1974, 49-18959
Int. Cl.² C08J *3/00*
U.S. Cl. 260—29.2 E **12 Claims**

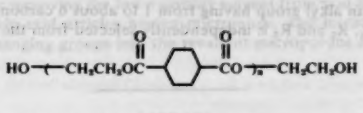
1. An aqueous insulating varnish which comprises an aqueous medium containing dissolved therein a polyester resin having an acid value of about 20 to 200 with a volatile basic compound, the resin being obtained by reacting

A. an organic polycarboxylic acid component comprising

a. at least 30 mol % of at least one of an aromatic tricarboxylic acid and the anhydride thereof in which up to about 30 mol % of the tricarboxylic acid and the anhydride thereof can be replaced by at least one of an aromatic tetracarboxylic acid and the anhydride thereof, and

b. about 0 to 70 mol % of at least one of a dicarboxylic acid and the anhydride thereof, and

B. an organic polyhydric alcohol component containing at least 20 mol % of a polyethylene terephthalate oligomer represented by the formula



wherein *n* is an integer of 1 to 5, in a OH/COOH equivalent ratio of about 1.0 to 2.0.

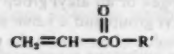
4,007,147

WATER BASED HARDBOARD COATING COMPOSITIONS OF AN ACRYLIC ESTER INTERPOLYMER LATEX, A VINYL CHLORIDE POLYMER LATEX, A WATER REDUCIBLE THERMOSET RESIN, AND PIGMENT(S)

Edward J. Leeson, Avon Lake, and Robert U. Ludwig, Lorain, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Apr. 30, 1975, Ser. No. 572,960
Int. Cl.² C08G *51/24*
U.S. Cl. 260—29.4 UA **10 Claims**

1. A water-based coating composition comprising (1) from about 50 parts to about 90 parts by weight on a dry basis of an acrylic ester interpolymer latex wherein the latex is prepared in the presence of from about 0.01 percent to about 3 percent by weight of soap emulsifier, the weight based upon the total weight of monomer, by the interpolymerization of (a) from about 9 percent to about 99 percent by weight of at least one acrylic ester monomer of the formula



wherein R′ is selected from the group consisting of an alkyl radical containing 1 to about 18 carbon atoms and alkoxyalkyl, alkylthioalkyl, and cyanoalkyl radicals containing 2 to about 8 carbon atoms in the group, (b) up to 90 percent by weight of a vinylidene comonomer containing a terminal $CH_2=C<$ group, and (c) from about 1 percent to about 10 percent by weight of a reactive cure-site monomer selected from the group consisting of carboxyl-containing vinylidene monomers, hydroxyl-containing vinylidene monomers, and hydroxyl-containing vinylidene monomers in combination with a carboxyl-containing vinylidene monomer or an acrylamide monomer, (2) from about 10 parts to about 50 parts by weight on a dry basis of a vinyl chloride polymer latex having substantially uniform particle size, wherein the latex is prepared by interpolymerization of the monomer(s) in the presence of a fatty acid soap emulsifier, (3) from about 5 parts to about 35 parts by weight per 100 parts by weight of latex polymer of a water reducible thermoset resin selected from the group consisting of melamine-formaldehyde resins and urea-formaldehyde resins, and (4) from about a 5 percent to about a 60 percent pigment volume concentration per total volume of latex.

4,007,148

ELECTROCONDUCTIVE COATINGS HAVING EXCELLENT COATING HOLDOUT PROPERTIES

Sally P. Ginter, and Ralph E. Friedrich, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 19, 1974, Ser. No. 534,384
Int. Cl.² C08L *47/00*
U.S. Cl. 260—29.6 WB **16 Claims**

1. An aqueous coating composition comprising as ingredients (1) a water-dispersible, electroconductive polymer in an amount sufficient to reduce the surface electrical resistivity of a non-conductive substrate having its surface coated with said composition to a value no greater than 10^{12} ohms at 20% relative humidity, and (2) a water-swellable polymer having

an average particle diameter when dispersed in the aqueous coating composition in the range from about 1 to about 100 micrometers, said water-swellable polymer being present in an amount sufficient to provide coating holdout when the composition is applied to raw paper stock.

4,007,149

PROCESS FOR PREPARING LATICES OF SULFONATED ELASTOMERS

Gilbert W. Burton, Mountainside, and Charles P. O'Farrell, Clark, both of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed July 2, 1975, Ser. No. 592,461

Int. Cl.[2] C08L *47/00*

U.S. Cl. 260—29.7 B **14 Claims**

1. A process for preparing a latex of a sulfonated low unsaturation elastomer, the elastomer being butyl rubber or EPDM, which comprises the steps of:

a. providing a cement of the elastomer and a volatile solvent;

b. sulfonating the elastomer cement with an acyl sulfate sulfonating agent;

c. passivating the sulfonated cement with at least a stoichiometric amount of an organic epoxide containing at least one reactive oxirane group;

d. providing an emulsion in water of the product of step (c) in neutralized form using an anionic surfactant, said product being neutralized with a weak base before or after emulsification; and

e. thereafter stripping off excess water and solvent whereby a stable latex emulsion is obtained.

4,007,150

USE OF PERFLUOROALKANESULPHONIC ACID AMIDES AND/OR CYCLIMMONIUM SALTS OF PERFLUOROALKANSULPHONIC ACIDS AS MOLD RELEASE AGENTS

Siegfried Adelmann, Krefeld; Dieter Margotte, Krefeld-Fischeln; Hugo Vernaleken, Krefeld-Bockum; Hans Niederprüm, Monheim; Johann Nikolaus Meussdoerffer, and Werner Nouvertne, both of Krefeld, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 9, 1976, Ser. No. 656,226

Claims priority, application Germany, Feb. 18, 1975, 2506726

Int. Cl.[2] C08K *5/36*

U.S. Cl. 260—30.8 R **8 Claims**

1. A molding composition comprising an aromatic polycarbonate and from about 0.001 to 1% by weight of a mold release agent selected from the group consisting of perfluoroalkanesulphonic acid amides and cyclimmonium salts of perfluoro-alkanesulphonic acids.

4,007,151

POLYURETHANE COATING COMPOSITION

Shinsaku Ogawa; Matsuei Yamanoue, and Norio Oyabu, all of Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed June 2, 1975, Ser. No. 583,221

Claims priority, application Japan, May 31, 1974, 49-60761

Int. Cl.[2] C08K *5/09*

U.S. Cl. 260—31.2 N **13 Claims**

1. A polyurethane coating composition comprising an aliphatic or alicyclic polyisocyanate containing at least 3 isocyanate groups; at least ⅓ equivalent, based on the isocyanate groups, of a monohydric alcohol; and a low-molecular-weight polyhydric alcohol containing at least 3 active hydrogen atoms capable of reacting with the isocyanate.

4,007,152

SEALING MATERIAL FOR PREVENTING WATER-LEAKAGE AND METHOD OF MANUFACTURING SAME

Yosikazu Kosaka, Otsu; Makoto Kounosu, Kyoto, and Masaaki Kondo, Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed May 30, 1974, Ser. No. 474,688

Int. Cl.[2] C08K *5/05, 5/10, 5/12;* **C08L** *29/04*

U.S. Cl. 260—31.6 **5 Claims**

1. Sealing material for prevention of waterleakage which possesses a degree of swelling with water of 50 to 300% by weight, a rate of swelling with water of 1.0 to 30% per minute and a hardness of 5 to 80 degrees, and consists essentially of (a) a water-insoluble partially saponified polyvinyl alcohol having a saponification degree of 35 to 65% by mole and a number average polymerization degree of 500 to 3,500, and (b) a mixture of glycerin and the glyceryl ester of a carboxylic acid selected from the group consisting of phthalic acid and propionic acid, the proportion of the glycerin to the glyceryl ester of a carboxylic acid being within the range of from 70:30 to 30:70 by weight and said mixture being present in an amount of 5 to 100 parts by weight based on 100 parts by weight of said water-insoluble partially saponified polyvinyl alcohol.

4,007,153

SILICONE DENTAL IMPRESSION COMPOSITIONS

Robert A. Smith, Schnectady, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed June 19, 1975, Ser. No. 588,202

Int. Cl.[2] C08K *5/01*

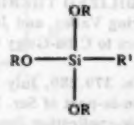
U.S. Cl. 260—33.6 SB **17 Claims**

1. A room temperature vulcanizing silicone dental impression composition which, before curing, consists essentially of from about 0.3 to about 0.7 parts by weight of a metallic salt of a monocarboxylic acid as a catalyst to about 100 parts of a base composition consisting essentially of:

a. from about 25 to about 35% by weight of a fluid diorganopolysiloxane containing terminal silicon-bonded hydroxy groups and having a viscosity of from 2,000 to 250,000 cps. at 25° C.;

b. from about 60 to about 75% by weight of a filler composition consisting essentially of an admixture of zinc oxide, calcium carbonate and pumice, said zinc oxide and calcium carbonate each being present in at least a sufficient amount to provide bulking and whitening and said pumice being present in at least a sufficient amount to provide putty-like consistency;

c. from about 0.05 to about 2% by weight of an organo-silicon cross-linker having the general formula:



wherein R is a radical selected from the group consisting of alkyl, alkenyl and aryl radicals and R^1 is a member of the group consisting of alkyl, alkenyl, aryl and alkoxy radicals.

4,007,154
NOVEL PIGMENT PASTE FOR CATIONIC ELECTRODEPOSITION

Karl F. Schimmel, Verona; Percy E. Pierce, Monroeville, and James E. Jones, Lower Burrell, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 1, 1975, Ser. No. 601,108
Int. Cl.² C08L 63/02
U.S. Cl. 260—37 EP 5 Claims

1. A pigment paste suitable for cationic electrodeposition comprising:

A. a resinous vehicle comprising the acidified reaction product of:

1. an organic polyepoxide material
2. an organic tertiary amine containing blocked isocyanate groups capable of unblocking at elevated temperature;

B. a pigment dispersed therein;

the pigment to resinous vehicle weight ratio being at least 2:1.

4,007,155
FLAME RETARDANT POLYCARBONATE COMPOSITION

Victor Mark, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.

Continuation-in-part of Ser. No. 429,645, Dec. 28, 1973, Pat. No. 3,931,100. This application Nov. 26, 1975, Ser. No. 635,731
Int. Cl.² C08L 69/00
U.S. Cl. 260—45.7 S 9 Claims

1. A flame retardant aromatic carbonate polymer composition comprising in admixture an aromatic carbonate polymer and a minor amount of an additive having the following formula:

$$(X_nR')_s[(X_nR)(SO_3M)]_p$$

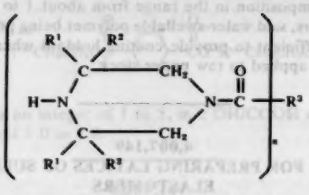
wherein X is an electron withdrawing radical, M is a metal selected from the group consisting of alkali metals and alkaline earth metals, R′ is an aryl radical of 1–2 aromatic rings, R is an aliphatic radical of 1–10 carbon atoms, n and m are integers of from 0–11, s is an integer of from 0–5 and p is an integer of from 1–4; or mixtures thereof with the proviso that when s is 0, R is an aliphatic radical of 2–10 carbon atoms and X is chlorine or bromine.

4,007,156
ACYLATED DERIVATIVES OF SUBSTITUTED PIPERAZINES AND POLYMERIC COMPOSITIONS STABILIZED THEREBY

Chester E. Ramey, Spring Valley, and John J. Luzzi, Carmel, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 379,289, July 16, 1973, abandoned, which is a continuation-in-part of Ser. No. 249,025, May 1, 1972, abandoned. This application June 27, 1975, Ser. No. 591,221
Int. Cl.² C07D 241/36
U.S. Cl. 260—45.8 N 23 Claims

1. A compound of the formula



wherein

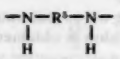
R^1 and R^2 together with the carbon to which they are bound form a cyclopentyl or cyclohexyl ring, which is unsubstituted or substituted with a methyl group;

n is an integer from 1 to 2;

when n is 1, R^3 is alkyl having from 1 to 24 carbon atoms, a phenyl group, or a group having the formula

wherein R^4 is alkyl having from 1 to 24 carbon atoms or phenyl;

when n is 2, R^3 is alkylene having from 1 to 10 carbon atoms, a carbon to carbon bond, a phenylene group or the group having the formula



wherein R^5 is alkylene having from 1 to 10 carbon atoms, a phenylene or (lower)alkyl substituted phenylene group.

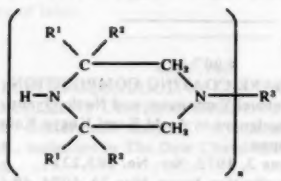
15. A composition of matter stabilized against ultraviolet deterioration consisting essentially of a synthetic organic polymer normally subject to ultraviolet deterioration containing from 0.01% to 2% by weight of the polymer of a stabilizing compound according to claim 1.

4,007,157
SUBSTITUTED PIPERAZINES AND POLYMERIC COMPOSITIONS STABILIZED THEREBY

Chester E. Ramey, Spring Valley, and John J. Luzzi, Carmel, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 378,368, July 11, 1973, abandoned, which is a continuation-in-part of Ser. No. 239,350, March 29, 1972, abandoned. This application June 27, 1975, Ser. No. 591,222
Int. Cl.² C07D 241/38
U.S. Cl. 260—45.8 N 23 Claims

1. A compound of the formula



wherein

R^1 and R^2 together with the carbon to which they are bound form a cyclopentyl or cyclohexyl ring, which is unsubstituted or substituted with a methyl group;

n is an integer of from 1 to 2;

when n is 1, R^3 is hydrogen, alkyl of from 1 to 20 carbon atoms or benzyl;

when *n* is 2, R^3 is alkylene of from 1 to 20 carbon atoms.

15. A composition of matter stabilized against ultraviolet deterioration consisting essentially of a synthetic organic polymer normally subject to ultraviolet deterioration containing from 0.01 to 2% by weight of the polymer of a stabilizing compound according to claim **1**.

4,007,158

NOVEL PIPERIDINE DERIVATIVES FOR THE STABILIZATION OF SYNTHETIC POLYMERS

Keisuke Murayama; Syoji Morimura; Takao Yoshioka; Toshimasa Toda; Eiko Mori; Hideo Horiuchi; Susumu Higashida; Katsuaki Matsui; Tomoyuki Kurumada; Noriyuki Ohta, and Hisayou Osawa, all of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

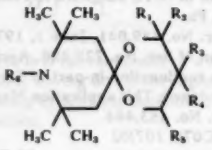
Filed July 3, 1974, Ser. No. 485,567

Claims priority, application Japan, July 20, 1973, 48-81369

Int. Cl.² C08K *5/00*

U.S. Cl. 260—45.8 NZ **6 Claims**

1. An improved polymer composition of the type comprising a synthetic polymer and a stabilizer therefor, the improvement comprising using as stabilizer at least one compound of formula:



(I)

wherein:

2 or 3 of R_1, R_2, R_3, R_4 and R_5 represent alkyl groups having from 1 to 4 carbon atoms, and the remainder of R_1, R_2, R_3, R_4 and R_5 represent hydrogen atoms; and

R_6 is selected from the group consisting of: a hydrogen atom, alkyl groups, alkenyl groups, alkynyl groups, aralkyl groups, hydroxyalkyl groups, alkoxyalkyl groups, aliphatic and aromatic acyloxyalkyl groups, cyanoalkyl groups, haloalkyl groups, epoxyalkyl groups, alkoxycarbonylalkyl groups, aliphatic acyl groups, alkoxycarbonyl groups and aralkoxycarbonyl groups.

4,007,159

ORGANIC SUBSTRATES STABILIZED BY NITROALKANE BASED HINDERED PHENOL COMPOUNDS

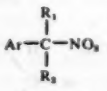
Harry Dounchis, Lawrenceville, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 475,318, May 31, 1974, abandoned. This application Apr. 30, 1976, Ser. No. 681,837

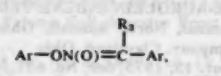
Int. Cl.² C08K *5/32*

U.S. Cl. 260—45.9 E **10 Claims**

1. Stabilized compositions comprising an organic material normally susceptible to oxidative deterioration containing per 100 parts of said organic material from about 0.001 to 5 parts by weight of a stabilizing antioxidant compound selected from the group having the formulas:



or



(II)

wherein Ar represents a 3,5-di-tertiarybutyl-4-hydroxybenzyl radical, R_1 and R_2 each may represent hydrogen, a lower C_1–C_4 alkyl radical or an Ar radical, and wherein Ar is as previously described and R_3 represents a lower C_1–C_4 alkyl or a methoxy or ethoxy substituted lower C_1–C_4 alkyl radical.

4,007,160

CHLORINE-CONTAINING EPOXY COMPOSITION

Richard J. Turley, Orange, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Oct. 28, 1975, Ser. No. 625,906

Int. Cl.² C08G *59/18*

U.S. Cl. 260—47 EC **7 Claims**

1. A liquid, curable epoxy composition comprised of

a. an epoxy resin having more than one α-epoxy group in the molecule,

b. a curing agent for said resin, and

c. 4,4,4-trichloro-1,2-epoxybutane in a proportion which is sufficient to reduce the combustibility of said resin.

4,007,161

POLYMERS CONTAINING CARBON ATOMS IN THE BACKBONE WITH PENDANT N-HYDROCARBYLCARBOXAMIDE GROUPS

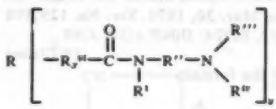
Charles B. Holder, Wappingers Falls; Richard F. Love, and Donald R. Lachowicz, both of Fishkill, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Division of Ser. No. 475,531, June 3, 1974. This application Dec. 30, 1974, Ser. No. 537,160

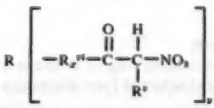
Int. Cl.² C08G *16/06, 2/38*

U.S. Cl. 260—66 **14 Claims**

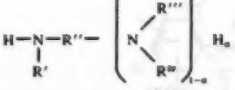
1. The method of preparing an amide polymer



which comprises reacting an alpha-nitroketone



with an amine



wherein R is a carbon containing polymer residue, R′, R‴, and R^{iv} are hydrogen or saturated hydrocarbon, R^v is saturated hydrocarbon, R″ and R^{vi} are divalent saturated hydrocarbon, y is 1 – 100, *a* is 0 or 1, and *x* is 1 thereby forming product amide polymer.

4,007,162

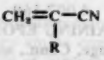
ACRYLONITRILE-ACROLEIN-INDENE TERPOLYMERS

Abolghassem Eskamani, North Randall, Ohio, assignor to Standard Oil Company, Cleveland, Ohio

Filed Nov. 13, 1975, Ser. No. 631,532
Int. Cl.² C08G 2/00, 10/02; C08F 210/00, 222/30
U.S. Cl. 260—73 R **6 Claims**

1. A terpolymer composition resulting from the polymerization in the presence of a free-radical generating polymerization initiator of

A. from 5 to 75% by weight of at least one nitrile having the structure



wherein R is hydrogen, a lower alkyl group having from 1 to 4 carbon atoms, or a halogen,

B. from 5 to 70% by weight of a member selected from the group consisting of acrolein and methacrolein, and

C. from 5 to 50% by weight of indene.

4,007,163

METHOD FOR HARDENING GELATIN

Teiji Habu; Shinobu Koremotsu; Tsuneo Wada; Takashi Sasaki, and Masayuki Matsumoto, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Mar. 31, 1975, Ser. No. 563,529
Claims priority, application Japan, Apr. 1, 1974, 49-37247
Int. Cl.² C09H 7/00
U.S. Cl. 260—117 **7 Claims**

1. A method for hardening gelatin, which comprises treating the gelatin with the combination of a compound having at least two mesyloxy groups in the molecule with a compound having at least two vinylsulfonyl groups in the molecule.

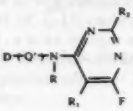
4,007,164

AZO DYESTUFFS CONTAINING 6-FLUORO-PYRIMIDINYL 4-REACTIVE GROUP

Hans-Samuel Bien, Burscheid, and Erich Klauke, Odenthal-Hannenberg, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 714,333, March 19, 1968, abandoned. This application Mar. 30, 1971, Ser. No. 129,598
Int. Cl.² C09B 62/22, 62/24; D06P 1/38, 3/66
U.S. Cl. 260—146 D **10 Claims**

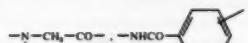
1. A reactive dyestuff of the formula

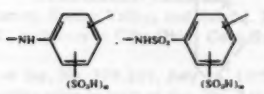


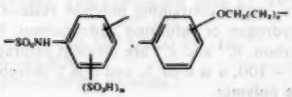
wherein

D is the radical of an azo dyestuff;

Q′ is linked to a benzene or naphthalene ring of D and is a direct linkage or a linking radical selected from the group consisting of —SO_2—, —NHCO—,







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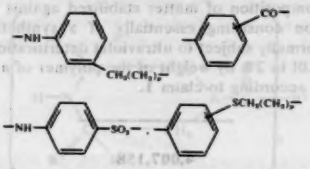


m is 0 to 2;

p is 0 or 1;

q is 1 or 2;

R is hydrogen or lower alkyl;

R_1 is hydrogen, Cl; Br; F; methyl; ethyl; mono-, di- or trichloromethyl, tribromomethyl or trifluromethyl; vinyl; allyl; nitro; cyano; carboxyl; sulfonic acid; methylsulfonyl; or phenylsulfonyl;

R_2 is hydrogen; methyl; ethyl; vinyl; allyl; mono-, di- or trichloromethyl, trifluoromethyl, or tribromomethyl; or phenyl; and F is fluoro.

4,007,165

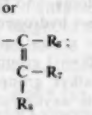
UNSYMMETRICAL TERTIARY-ALIPHATIC AZOALKANES

Ronald Edward MacLeay, Williamsville, and Chester Stephen Sheppard, Tonawanda, both of N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 149,041, June 1, 1971, abandoned, which is a division of Ser. No. 725,180, April 29, 1968, abandoned, which is a continuation-in-part of Ser. No. 616,158, Feb. 15, 1967, abandoned. This application Mar. 21, 1974, Ser. No. 453,444
Int. Cl.² C07C 107/02
U.S. Cl. 260—192 **20 Claims**

1. A compound of the formula $(R'')_3C{-}N{=}N{-}R'$ in which $(R'')_3C-$ is different from $-R'$ and wherein

(a) R′ is $-C(R_1)(R_2)(Z)$ or



(b) R″ is alkyl of 1–13 carbons, phenalkyl of 7–12 carbons or phenyl, not more than one R″ being phenyl;

(c) R_1 and R_2 are alkyl of 1–13 carbons, phenalkyl of 7–12 carbons, cycloalkyl of 3–12 carbons or, taken together, alkylene of 2–16 carbons, and R_2 can also be phenyl;

(d) R_3 and R_4 are hydrogen, alkyl of 1–13 carbons, cycloalkyl of 3–12 carbons or, taken together, alkylene of 2–16 carbons;

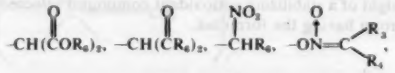
(e) R_5 is alkyl of 1–13 carbons, cycloalkyl of 3–12 carbons or aryl of 6–14 carbons;

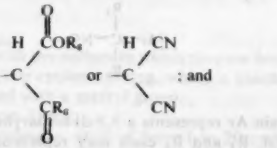
(f) R_6 is alkyl of 1–13 carbons;

(g) R_7 and R_8 are hydrogen or alkyl of 1–13 carbons;

(h) R_6 and R_7 together can form alkylene of 2–16 carbons;

(i) Z is —Cl, —Br, —OR_5, —N_3, —SCN, —OCN, —OH, —NHR_5, —R_5, —$NHNHR_5$, —OC(=O)OR_5, —OC(=O)OOR,





(j) R is $(R'')_3C-$.

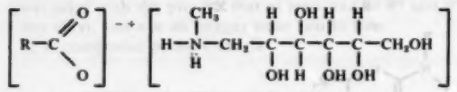
4,007,166

MEGLUMINE COMPLEXES OF FUNGICIDAL POLYENE MACROLIDE ANTIBIOTICS AND METHOD OF PREPARING SAME

Valter Osvaldovich Kulbakh, Bukharestskaya ulitsa, 86, korpus 1, kv. 85; Tatyana Mikhailovna Kokushina, prospekt Metallistov, 16, kv. 66; Irina Kondratievna Lagert, Moskovskoe shosse, 16, kv. 163; Georgy Avxentievich Mikhailets, ulitsa Lanskaya, 10, kv. 100; Galina Vasilievna Kholodova, ulitsa B. Pushkinskaya, 40, kv. 9; Oleg Nikolaevich Ekzemplyarov, Suvorovsky prospekt, 22b, kv. 14; Ruvim Bentsionovich Zelmanov, ulitsa Chaikovskogo, 13, kv. 20; Leonid Borisovich Sokolov, ulitsa Novorossiiskaya, 22, kv. 45; Evgeny Davidovich Etingov, ulitsa Zvezdnaya, 8, kv. 43, and Irina Mikhailovna Lushitskaya, ulitsa Belgradskaya, 42, korpus 2, kv. 26, all of Leningrad, U.S.S.R.

Filed Apr. 24, 1974, Ser. No. 463,843
Int. Cl.² C07H 5/04
U.S. Cl. 536—17 **6 Claims**

1. Meglumine complexes of fungicidal polyene macrolide antibiotics of the formula:



wherein R is the remainder of a fungicidal polyene macrolide antibiotic having no carboxyl groups, selected from the group consisting of tetraene antibiotics and non-aromatic heptaene antibiotics.

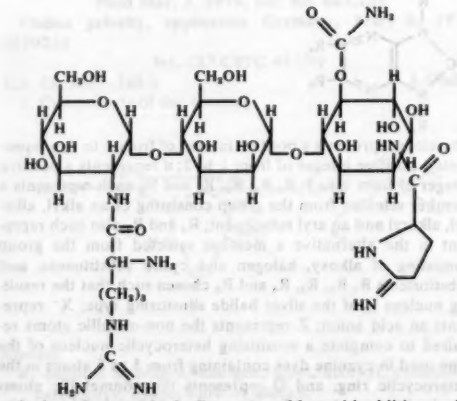
4,007,167

ANTIBIOTIC BM123 AND PRODUCTION THEREOF

John Henry Edward James Martin; Homer David Tresner, both of New City, N.Y., and John Norman Porter, Ramsey, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 513,358, Oct. 9, 1974, abandoned, which is a continuation-in-part of Ser. No. 458,274, April 5, 1974, abandoned, which is a continuation-in-part of Ser. No. 297,173, Oct. 12, 1972, abandoned. This application Aug. 21, 1975, Ser. No. 606,634
Int. Cl.² C07H 17/02, 15/02
U.S. Cl. 536—17 **5 Claims**

1. A compound selected from the group consisting of antibacterial BM123α of the formula:



and the pharmacologically acceptable acid-addition salts thereof.

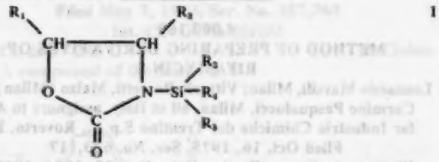
4,007,168

PROCESS FOR PREPARING PENICILLINS DERIVATIVES

Antonio Luis Palomo Coll, Maestro Perez Cabrero 7, Barcelona, Spain

Division of Ser. No. 443,849, Feb. 19, 1974, Pat. No. 3,947,465. This application Oct. 30, 1975, Ser. No. 627,040
Claims priority, application Spain, Feb. 21, 1973, 411867
Int. Cl.² C07D 499/44, 499/42
U.S. Cl. 260—239.1 **6 Claims**

1. An improved process for preparing a penicillin or cephalosporin derivative by means of a silylated intermediate, the improvement comprising reacting a silylating agent of the following formula:

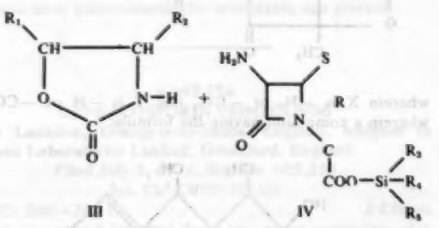


I

where R_1 and R_2 are hydrogen, phenyl groups or alkyl groups having one to three carbon atoms, R_3 and R_4 are an alkyl group having one to three carbon atoms and R_5 is chosen from the group comprising alkyl groups and chlorine, with 6-APA, 7-ACA or 7-ADCA of the formula II:

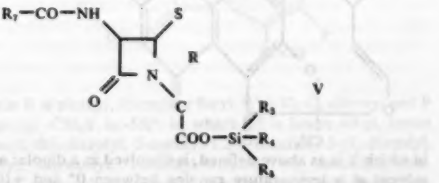
II

wherein R is the remaider of 6-APA, 7-ACA or 7-ADCA to obtain a solution with the composition given by the general formula:



III IV

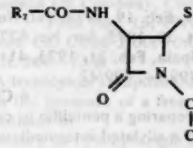
wherein R, R_1, R_2, R_3, R_4 and R_5 are as defined above, said solution containing compounds III and IV being reacted thereafter with a conventionally activated carboxylic acid to obtain an N-acyl derivative of the formula:



V

wherein R, R_3, R_4 and R_5 are as defined above and R_7 is the remainder of the carboxylic acid reactant, and subsequently

treating said compound with water or an alcohol having from 1 to 5 carbon atoms resulting in a compound of the formula



VI

wherein R and R_7 are as defined above.

4,007,169

METHOD OF PREPARING DERIVATIVES OF RIFAMYCIN S

Leonardo Marsili, Milan; Vittorio Rossetti, Melzo (Milan), and Carmine Pasqualucci, Milan, all of Italy, assignors to Archifar Industrie Chimiche del Trentino S.p.A., Roverto, Italy

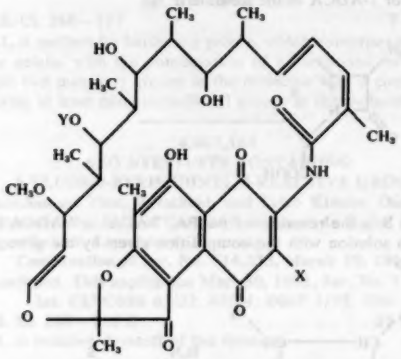
Filed Oct. 16, 1975, Ser. No. 623,117

Claims priority, application Italy, Oct. 29, 1974, 28908/74

Int. Cl.² C07D *498/08*

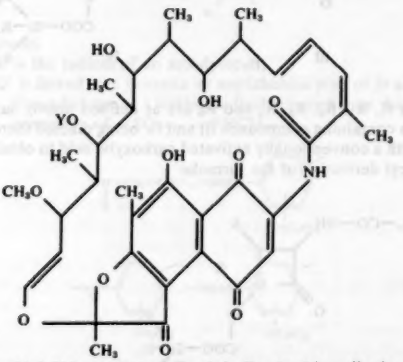
U.S. Cl. 260—239.3 P **7 Claims**

1. A method of preparing a Rifamycin S having the formula:



(I)

wherein X is $-N_3$ or $-NH_2$ and Y is $-H$ or $-COCH_3$, wherein a compound having the formula:



(II)

in which Y is as above defined, is dissolved in a dipolar aprotic solvent at a temperature ranging between 0° and +100° C, adding sodium azide and stirring for at least 30 minutes, a compound of formula I so obtained being recovered from the reaction mass.

4,007,170

PHOTOGRAPHIC EMULSIONS CONTAINING METHINE DYES HAVING A 1H-IMIDAZO[4,5-b]PYRAZINE NUCLEUS

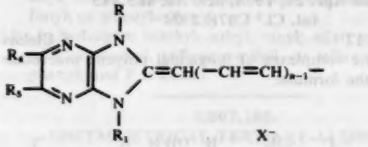
Wilbur Seth Gaugh, Webster; Donald Warren Heseltine, Rochester; David Michael Sturmer, Pittsford, and John Paul Freeman, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 388,867, Aug. 16, 1973, Pat. No. 3,936,308. This application June 26, 1974, Ser. No. 483,336

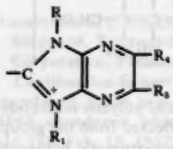
Int. Cl.² C07C *471/04*, *401/06*, *403/06*

U.S. Cl. 260—240 E **4 Claims**

1. A silver halide sensitizing methine dye selected from those having one of the following formulas:



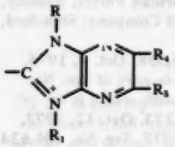
X⁻



Z

$$R_2-N(-CH=CH)_{g-1}-C=CH(-CH=CH)_{n-1}-$$

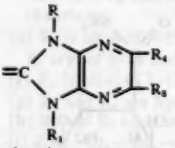
X⁻



and

Q

$$O=C-C(=CH-CH)_{d-1}=$$



wherein *n* represents a positive integer of from 1 to 4; *g* represents a positive integer of from 1 to 2; *d* represents a positive integer of from 1 to 3; R, R_1, R_3, R_4 and R_5 each represents a member selected from the group consisting of an alkyl, alkenyl, alkaryl and an aryl substituent; R_4 and R_5 also each represent in the alternative a member selected from the group consisting of alkoxy, halogen and cyano substituents, said substitutents R, R_1, R_3, R_4 and R_5 chosen such that the resulting nucleus is of the silver halide sensitizing type; X^- represents an acid anion; Z represents the non-metallic atoms required to complete a sensitizing heterocyclic nucleus of the type used in cyanine dyes containing from 5 to 6 atoms in the heterocyclic ring; and Q represents the nonmetallic atoms required to complete a 5 or 6 membered silver halide sensitizing heterocyclic nucleus of the type used in merocyanine dyes.

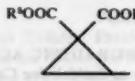
4,007,171
INTERMEDIATES FOR PROSTANOIC ACIDS

Nedumparambil A. Abraham, Dollard des Ormeaux; Jehan F. Bagli, Kirkland, and Tibor Bogri, Montreal, all of Canada, assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 351,381, April 16, 1973, Pat. No. 3,917,668. This application Apr. 10, 1975, Ser. No. 567,036
Int. Cl.² C07C *69/74*
U.S. Cl. 260—240 R 10 Claims

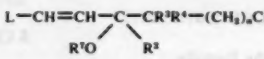
1. A compound of the formula

in which L is the radical



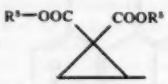
wherein R^5 is lower alkyl, R^3 and R^4 each are hydrogen or lower alkyl with the proviso that at least one of R^3 and R^4 is lower alkyl, and *n* is an integer from two to five.

5. A compound of the formula



(4)

in which L is the radical



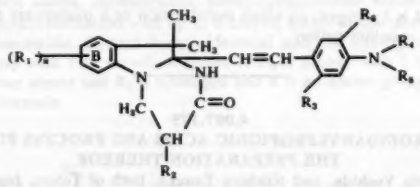
wherein R^5 is lower alkyl, R^2, R^3 and R^4 each are hydrogen or lower alkyl with the provisos that at least one of R^2, R^3 or R^4 is hydrogen and at least one of R^2, R^3 and R^4 is lower alkyl, R^7 is hydrogen or a radical suitable for protecting a hydroxyl group selected from the class consisting of tetrahydropyran-2-yl, tetramethylsilyl, dimethylisopropylsilyl and tertiarybutyl, and *n* is an integer from two to five.

4,007,172
DYESTUFF INCLUDING PYRIMIDO-INDOLE MOIETY

Hubertus Psaar, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 2, 1976, Ser. No. 663,138
Claims priority, application Germany, Mar. 8, 1975, 2510238
Int. Cl.² C07C *487/04*
U.S. Cl. 260—240.9 6 Claims

1. Compounds of the formula



wherein

R_1 denotes hydrogen, halogen, alkyl, alkenyl, cycloalkyl, carbalkoxy, cyano, nitro or alkoxy,

R_2 denotes hydrogen or alkyl,

R_3 denotes hydrogen, alkyl, alkoxy or halogen,

R_4 and R_5 denote alkyl, alkenyl, cycloalkyl, aryl or aralkyl,

R_6 denotes hydrogen, alkyl or alkoxy and

n denotes the numbers 1–4,

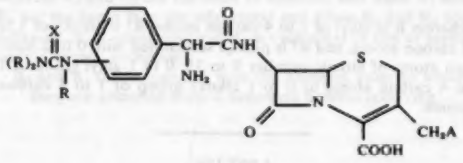
it being possible for the abovementioned alkoxy and hydrocarbon radicals optionally to contain non-ionic substituents.

4,007,173
α-AMINO-α-(UREIDOPHENYL)ACETAMIDOCEPHALOSPORINS

John Russel Eugene Hoover, Glenside, Pa., and Jerry Arnold Weisbach, Cherry Hill, N.J., assignors to SmithKline Corporation, Philadelphia, Pa.

Filed May 7, 1973, Ser. No. 357,763
Int. Cl.² C07D *501/36*
U.S. Cl. 260—243 C 25 Claims

1. A compound of the formula



wherein:

the $(R)_2$ NCXNR group is at the para or meta position;

R is hydrogen or lower alkyl of 1–4 carbon atoms;

X is oxygen or sulfur;

A is SHet; and

Het is tetrazolyl, triazolyl, thiadiazolyl, oxadiazolyl, diazolyl, pyridyl, pyrimidyl, or pyradinyl, unsubstituted or substituted with one or two substituents selected from the group consisting of C_1–C_8 alkyl, C_1–C_8 alkoxy, allyloxy, oxide, halogen, carboxamido, carboxyl, carbalkoxy of C_1–C_8, mercapto, methylthio, trifluoromethyl, hydroxy, amino, alkylamino, dialkylamino, each undefined alkyl having 1–6 carbon atoms

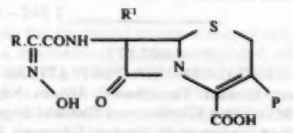
or a non-toxic pharmaceutically acceptable salt thereof.

4,007,174
CEPHALOSPORIN COMPOUNDS

Brian Laundon, Grange-over-Sands, England, assignor to Glaxo Laboratories Limited, Greenford, England

Filed July 2, 1974, Ser. No. 485,233
Int. Cl.² C07D *501/20*
U.S. Cl. 260—243 C 3 Claims

1. A compound selected from the group consisting of a cephalosporin antibiotic of the formula:



wherein R is phenyl, thienyl or furyl; R^1 is C_1-C_4 alkoxy; and P is a group $-CH_2Y$ is $-SR^6$; in which R^6 is lower alkyl, lower alkanoyl, thiadiazolyl, 5-methyl-1,3,4-thiadizol-2-yl, diazolyl, triazolyl, tetrazolyl, 1-methyl-tetrazol-5-yl, thiazolyl, thiatriazolyl, oxazolyl, oxadiazolyl, benzimidazoyl and benzoxazolyl; which is the syn isomer or a mixture of syn and anti isomers containing at least 75% of the syn isomer and a physiologically acceptable salt thereof.

4,007,175

2,4,6-SUBSTITUTED-3,5-DIOXO-1,2,4,6-THIATRIAZINES

Hans Georg Franke, Orinda, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 453,149, March 21, 1974, Pat. No. 3,915,688, which is a division of Ser. No. 146,498, May 24, 1971, Pat. No. 3,817,993. This application Aug. 4, 1975, Ser. No. 601,871

Int. Cl.² C07D *285/00*

U.S. Cl. 260—243 R **3 Claims**

1. A compound of the formula

wherein R is alkyl of 1 to 4 carbon atoms; R^1 is alkoxy of 1 to 3 carbon atoms; and R^2 is phenyl substituted with 0 to 2 halogen atoms of atomic number 9 to 35, 0 to 1 alkyl group of 1 to 4 carbon atoms or 0 to 1 alkoxy group of 1 to 4 carbon atoms.

4,007,176

CEPHALOSPORIN DERIVATIVES

Christian Berger, Le Plessis Robinson; Daniel Farge, Thiais; Georges Gros, Bourg-la-Reine; Mayer Naoum Messer, Bievres, and Claude Moutonnier, Le Plessis-Robinson, all of France, assignors to Rhone-Poulenec S.A., Paris, France

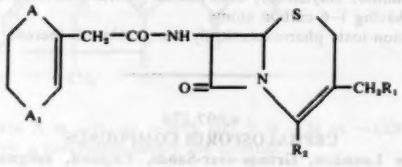
Filed Nov. 12, 1974, Ser. No. 523,007

Claims priority, application France, Nov. 14, 1973, 73.40431; Apr. 25, 1974, 74.14436

Int. Cl.² C07D *501/24*

U.S. Cl. 260—243 C **12 Claims**

1. A cephalosporin derivative of the formula:



wherein one of A and A_1 represents oxygen or sulphur and the other represents sulphur, R_1 represents hydrogen, acetoxy, (5-methyl-1,3,4-thiadiazol-2-y)thio or (1-methyl-1,2,3,4-tetrazol-5-yl)thio and R_2 represents carboxy, or R_1 represents a pyridinio radical and R_2 represents the carboxylate ion, and when R_2 represents the carboxy radical pharmaceutically-acceptable salts thereof.

4,007,177

CEPHALOSPORIN DERIVATIVES

Hideo Nakao; Hiroaki Yanagisawa; Mitsuo Nagano; Bunji Shimizu; Masakatsu Kaneko, and Shinichi Sugawara, all of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

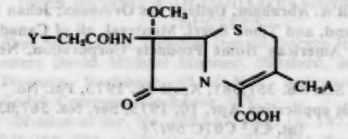
Filed Nov. 14, 1974, Ser. No. 523,819

Claims priority, application Japan, Nov. 26, 1973, 48-132441; Nov. 26, 1973, 48-132442; Dec. 18, 1973, 48-142097; Aug. 12, 1974, 49-92129; Aug. 12, 1974, 49-92131

Int. Cl.² C07D *501/50, 501/56*

U.S. Cl. 260—243 C **5 Claims**

1. A compound having the formula



wherein A represents a (1-methyl-1H-tetrazol-5-yl)thio group and Y represents a 2-hydroxy-ethylthio group, a methylsulfonyl group, an ethylsulfonyl group, or a sydnon-3-yl group and a nontoxic pharmaceutically acceptable salt thereof.

4,007,178

O-ACYL-7-ACYLAMINOCEPHALOSPORADESIC ACIDS

David A. Berges, Audubon, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

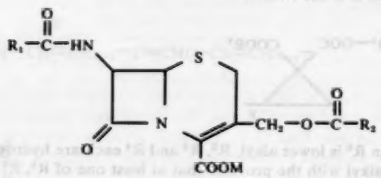
Division of Ser. No. 255,632, May 22, 1972, Pat. No. 3,905,967, which is a continuation-in-part of Ser. No. 141,380, May 7, 1971, abandoned. This application May 15, 1975, Ser. No. 577,816

Claims priority, application United Kingdom, Apr. 10, 1972, 16342/72

Int. Cl.² C07D *501/34*

U.S. Cl. 260—243 C **5 Claims**

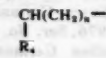
1. A compound of the formula:



in which:

R_1 is 2-thienylmethyl, 4-pyridylthiomethyl, cyanomethyl, tetrazolylmethyl, sydnone-3-methyl, α-hydroxybenzyl, α-hydroxy-2-thienylmethyl, α-aminobenzyl, α-aminocyclohexa-1,4-dienylmethyl or α-amino-2-thienylmethyl;

R_2 is



R_4 is hydrogen, phenyl, benzyl or lower alkyl, optionally substituted by a lower alkylthio, mercapto, hydroxy, carboxy or amino substituent;

n is 0–3 and

M is hydrogen, an alkali metal cation or a quaternary ammonium cation.

4,007,179

OXOINDANYLPROPIONIC ACIDS AND PROCESS FOR THE PREPARATION THEREOF

Norio Yoshida, and Kiichiro Tanaka, both of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

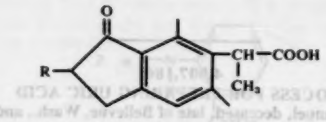
Filed Jan. 27, 1976, Ser. No. 652,727

Claims priority, application Japan, Feb. 19, 1975, 50-20696

Int. Cl.² C07D *295/00*

U.S. Cl. 260—247.2 R **5 Claims**

1. An oxoindanylpropionic acid having the formula



wherein R represents ethyl or isopropyl and a salt thereof.

5. The piperidine salt of the acid of claim 2.

4,007,180
PERINONE DYESTUFFS

Helmut Tröster, Frankfurt am Main, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

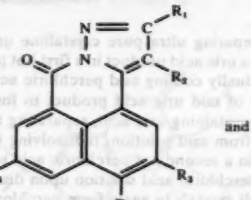
Division of Ser. No. 384,794, Aug. 2, 1973, Pat. No. 3,920,662. This application Mar. 27, 1975, Ser. No. 562,847

Claims priority, application Germany, Aug. 4, 1972, 2238378

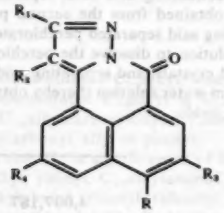
Int. Cl.² C07D *471/06*

U.S. Cl. 260—247.2 A 4 Claims

1. Dyestuffs consisting of the mixture of isomers of the formulae



and



wherein R_1 is hydrogen, alkyl with 1 to 20 carbon atoms, alkoxyalkyl or alkoxycarbonyl each with up to 4 carbon atoms, benzyl, alkoxycarbonyl with up to 20 carbon atoms or phenyl, R_2 is alkoxycarbonyl with up to 20 carbon atoms, cyano, alkanoyl, alkoxyalkoxycarbonyl each with up to 4 carbon atoms, carbonamido, phenylcarbonamido, mono- or dialkylcarbonamido with up to 8 carbon atoms or cyclohexylcarbonamido, R_3 and R_4 are identical and are hydrogen or alkoxy with 1 to 4 carbon atoms or R_3 is alkoxy with 1 to 4 carbon atoms and R_4 is hydrogen and R is an amino group of the formula

wherein R_5 and R_6 together are morpholine or 2,6-dimethylmorpholine.

4,007,181
ADAMANTYL CONTAINING GUANIDINES

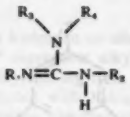
Donald W. DuCharme, Copper Township, Kalamazoo County, and Louis L. Skaletzky, Kalamazoo, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Feb. 11, 1974, Ser. No. 441,398

Int. Cl.² C07D *295/14*

U.S. Cl. 260—247.5 R 7 Claims

1. A compound of the formula



wherein R_1 and R_2 are the same or different and when R_1 and R_2 are the same they are adamantyl and when R_1 and R_2 are different, R_1 is adamantyl and R_2 is cycloalkyl of five to seven carbon atoms, inclusive;

R_3 and R_4 taken together with the nitrogen atom to which they are attached form a saturated heterocyclic ring

wherein

is pyrrolidino, piperidino, hexamethyleneimino, piperazino, N-alkylpiperazino wherein alkyl is one to three carbon atoms, inclusive, morpholino or thiomorpholino.

4,007,182
PROCESS FOR PRODUCING TRICHLOROISOCYANURIC ACID FROM SELECTED SYMMETRICAL TRIAZINES

John A. Wojtowicz, Cheshire, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Feb. 24, 1976, Ser. No. 660,962

Int. Cl.² C07D *251/36*

U.S. Cl. 260—248 C 13 Claims

1. A process for producing trichloroisocyanuric acid by the reaction of a symmetrical triazine compound selected from the group consisting of ammeline, chlorosubstituted ammeline, an alkaline, an alkali metal salt of ammeline, ammelide, chlorosubstituted ammelide, an alkali metal salt of ammelide, and mixtures thereof with hypochlorous acid to form a reaction mixture containing trichloroisocyanuric acid in which the number of moles of said hypochlorous acid reacted per mole of said symmetrical triazine compound is at least X + 2Y, where X represents the number of hydrogen and alkali metal atoms present in said symmetrical triazine compound and Y represents the number of nitrogen atoms in said symmetrical triazine compound which are replaced by oxygen atoms, and separating said trichloroisocyanuric acid from said reaction mixture.

4,007,183

STABILISERS FOR POLYOLEFINES

Helmut Müller, Binningen; Siegfried Rosenberger, Riehen, both of Germany, and Kurt Schwarzenbach, Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

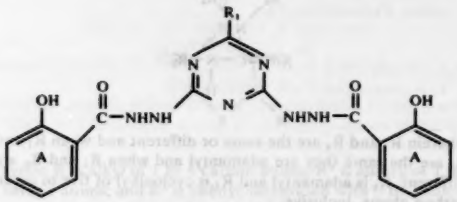
Division of Ser. No. 150,757, June 7, 1971, Pat. No. 3,850,918. This application May 20, 1974, Ser. No. 471,408

Claims priority, application Sweden, June 17, 1970, 9182; Oct. 2, 1970, 14666/70

Int. Cl.² C07D *251/48*

U.S. Cl. 260—249.8 **5 Claims**

1. Compounds of the formula



wherein R_1 is alkyl of 1 to 18 carbon atoms or alkoxy of 1 to 18 carbon atoms, groups or the group and the rings A are unsubstituted or are substituted by 1 to 2 alkyl groups with 1 to 8 carbon atoms each, an alkoxy group with 1 to 18 carbon atoms and/or 1 to 3 chlorine atoms.

4,007,184

SUBSTITUTED ALKYL ESTERS OF QUINOXALINE-DI-N-OXIDE-2-CARBOXYLIC ACID

Timothy H. Cronin, East Lyme, and Kenneth Richardson, Groton, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 397,162, Sept. 13, 1973, Pat. No. 3,915,975, which is a division of Ser. No. 135,792, April 20, 1971, Pat. No. 3,818,007, and a continuation-in-part of Ser. No. 20,841, March 18, 1970, abandoned. This application Oct. 9, 1975, Ser. No. 621,219

Int. Cl.² C07D *241/52*

U.S. Cl. 260—250 QN **1 Claim**

1. 3-Methyl-2-quinoxalinecarboxylic acid, 2-aminoethyl ester, 1,4-dioxide.

4,007,185

3,5-SUBSTITUTED-1,2,4-OXADIAZOLE INNER QUATERNARY AMMONIUM SALTS

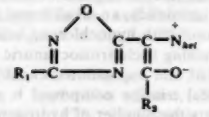
Anne Mary Von Esch, North Chicago, and Aldo Joseph Crovetti, Lake Forest, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 316,189, Dec. 18, 1972, Pat. No. 3,907,809, which is a division of Ser. No. 85,747, Oct. 30, 1970, Pat. No. 3,725,424. This application May 22, 1975, Ser. No. 580,085

Int. Cl.² C07D *271/06*

U.S. Cl. 260—251 R **1 Claim**

1. The compound of the formula



in which N_{het} is selected from the group consisting of pyrimidinyl; halo and loweralkyl substituted pyrimidinyl; R_1 is selected from the group consisting of loweralkyl, phenyl nitrophenyl, dinitrophenyl, nitrofuryl, and nitrothienyl; and R_2 is selected from the group consisting of hydrogen and a loweralkyl wherein said loweralkyl groups have from 1–4 carbon atoms.

4,007,186

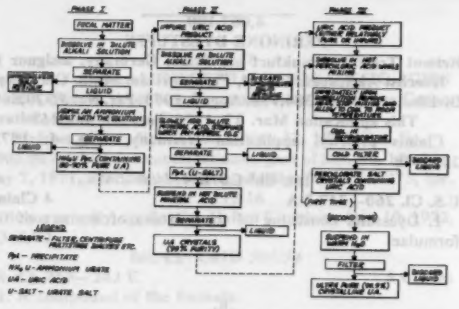
PROCESS FOR PREPARING URIC ACID

Carl F. Emanuel, deceased, late of Bellevue, Wash., and Mary Victoria Emanuel, administratrix, 1025 156th NE., Bellevue, Wash. 98007

Filed Sept. 20, 1974, Ser. No. 507,728

Int. Cl.² C07D *473/04*

U.S. Cl. 260—255 **18 Claims**



1. A process of preparing ultra pure crystalline uric acid comprising dissolving a uric acid product in a first hot perchloric acid solution, gradually cooling said perchloric acid solution upon dissolution of said uric acid product to form perchlorate salt crystals containing uric acid, separating the perchlorate salt crystals from said solution, redissolving the perchlorate salt crystals in a second hot perchloric acid solution, cooling said second perchloric acid solution upon dissolution of said perchlorate salt crystals to again form perchlorate salt crystals containing uric acid, separating the perchlorate salt crystals obtained from the second perchloric acid solution, suspending said separated perchlorate salt crystals in a warm water solution to dissolve the perchloric acid and precipitate uric acid crystals, and separating said uric acid crystals from said warm water solution thereby obtaining ultra pure crystalline uric acid.

4,007,187

FURO (2,3D) PYRIMIDINES

Claude P. Fauran, Paris; Guy R. Bourgery, Colombes; Guy M. Raynaud, and Nicole A. M. Dorme, both of Paris, all of France, assignors to Delalande S.A., Courbevoie, France

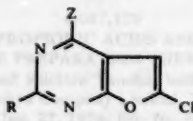
Filed Sept. 17, 1974, Ser. No. 506,826

Claims priority, application France, Oct. 2, 1973, 73.35190; May 20, 1974, 74.17484

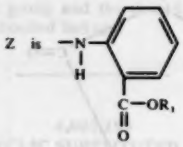
Int. Cl.² C07D *239/00*

U.S. Cl. 260—256.4 F **4 Claims**

1. A compound having the formula



in which R is alkyl having one to 4 carbon atoms, phenyl, or phenyl substituted by at least one halogen or by a trifluoromethyl,



in which R_1 is hydrogen or alkyl containing one to 4 carbon atoms.

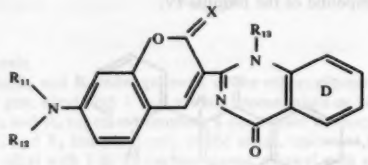
4,007,188

COUMARIN AND COUMARINIMIDE DERIVATIVES

Werner Koch, Oberwil, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Continuation-in-part of Ser. No. 332,431, Feb. 14, 1973, abandoned. This application Nov. 25, 1974, Ser. No. 526,956
Claims priority, application Switzerland, Jan. 2, 1973, 51/73
Int. Cl.² C07D *405/04*
U.S. Cl. 260—256.4 Q 8 Claims

1. A compound of formula Ia,



Ia

wherein

X is O or NH,

R_{11} is C_{1-4}alkyl or monosubstituted C_{1-4}alkyl, wherein the substituent of monosubstituted C_{1-4}alkyl is C_{1-4}alkoxy, cyano, formyloxy, C_{1-4}alkylcarbonyloxy, C_{1-4}alkoxycarbonyloxy, C_{1-4}alkoxycarbonyl, allyl or phenyl,

R_{12} is hydrogen or has one of the significances of R_{11},

R_{13} is hydrogen, C_{1-4}alkyl, phenyl, C_{1-4}alkylaminoC_{1-4}alkyl, C_{1-4}alkylaminoC_{1-4}alkylphenyl, thionyl, thiazolyl, benzothiazolyl, methoxybenzothiazolyl, C_{1-4}alkylcarbonyl, benzoyl, C_{1-4}alkylsulphonyl, phenylsulphonyl or toluylsulphonyl, and

ring D is unsubstituted or substituted by 1 or 2 substituents selected from chloro, bromo, methyl, methoxy, acetyl, benzoyl, methylsulphonyl, phenylsulphonyl, toluylsulphonyl, aminosulphonyl and C_{1-4}alkylaminosulphonyl.

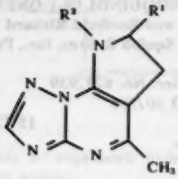
4,007,189

PYRROLOTRIAZOLOPYRIMIDINE DERIVATIVES AND PROCESS FOR THE PREPARATION THEREOF

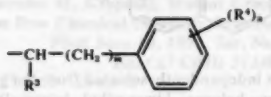
Yasunobu Sato; Hiromu Takagi; Yasuo Shimoji, and Seiji Kumakura, all of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

Filed May 4, 1976, Ser. No. 683,055
Claims priority, application Japan, May 31, 1975, 50-65832
Int. Cl.² C07D *487/14*
U.S. Cl. 260—256.4 F 10 Claims

1. A pyrrolotriazolopyrimidine having the formula



wherein R^1 represents hydrogen or alkyl having from 1 to 4 carbon atoms and R^2 represents alkyl having from 1 to 4 carbon atoms, cycloalkyl having from 5 to 8 carbon atoms, phenyl, phenyl substituted with halogen selected from the group consisting of fluorine, chlorine or bromine, or a phenylalkyl having the formula



in which R^3 represents hydrogen or alkyl having from 1 to 4 carbon atoms, R^4 represents halogen selected from the group consisting of fluorine, chlorine or bromine, alkyl having from 1 to 4 carbon atoms or alkoxy having from 1 to 4 carbon atoms, m represents an integer from 0 to 2 and n represents an integer from 0 to 3, and pharmacologically acceptable salts thereof.

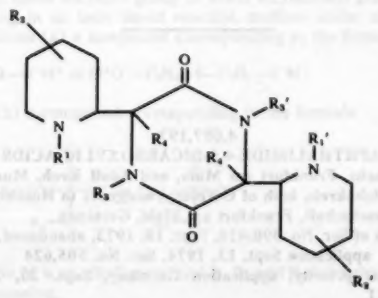
4,007,190

3,6-BIS(2-PIPERIDINYL)-2,5-PIPERAZINEDIONE COMPOUNDS

Tsung-Ying Shen, Westfield; Norman P. Jensen, Watchung, and Arthur F. Wagner, Princeton, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 201,956, Nov. 24, 1971, abandoned. This application June 21, 1974, Ser. No. 481,622
Int. Cl.² C07D *401/14*
U.S. Cl. 260—268 DK 3 Claims

1. A compound having the formula:



wherein R_1 and/or R_1' is haloloweralkyl; R_2 and/or R_2' is halogen; and R_3, R_3', R_4 and R_4' are hydrogen.

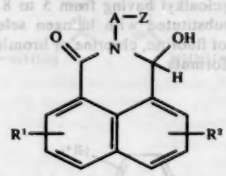
4,007,191

2-PIPERIDINYL OR TETRAHYDROPYRIDINYL)-ALKYL)-2,3-DIHYDRO-3-HYDROXY-1H-BENZ(DE)ISOQUINOLIN-1-ONES

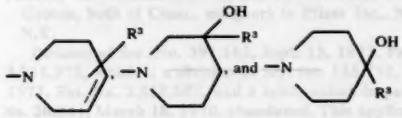
Peter C. Wade, Pennington, N.J., and Berthold Richard Vogt, Yardley, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Oct. 14, 1975, Ser. No. 621,939
Int. Cl.² C07D 401/06
U.S. Cl. 260—288 CF **15 Claims**

1. A compound of the formula:



wherein R^1 and R^2 are independently selected from the group consisting of hydrogen, halogen, lower alkyl, lower alkoxy, lower alkylthio, trifluoromethyl, nitro, amino and cyano; Z is selected from the group consisting of



wherein the dashed line indicates the optional presence of a double bond; R^3 is selected from the group consisting of phenyl, phenyl-lower alkyl, substituted phenyl and substituted phenyl-lower alkyl wherein said substituent is one or two members selected from the group consisting of lower alkyl, lower alkoxy, lower alkylthio, halogen, amino, nitro, and trifluoromethyl provided that only one phenyl substituent is selected from amino, nitro, trifluoromethyl, and lower alkylthio; and A is straight or branched chain alkylene of 2 to 8 carbons.

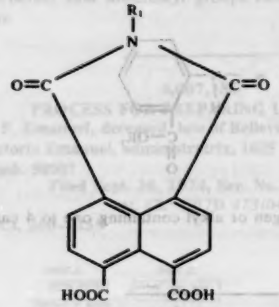
4,007,192

NAPHTHALIMIDE-4,5-DICARBOXYLIC ACIDS

Otto Fuchs, Frankfurt am Main, and Adolf Kroh, Munster, Oberlahnkreis, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Division of Ser. No. 398,410, Sept. 18, 1973, abandoned. This application Sept. 13, 1974, Ser. No. 505,624
Claims priority, application Germany, Sept. 20, 1972, 2246111
Int. Cl.² C07D 217/24, 491/06
U.S. Cl. 260—281 F **1 Claim**

1. A compound of the formula



or the anhydride thereof, wherein R_1 is 3-(4'-hydroxy)-butoxypropyl.

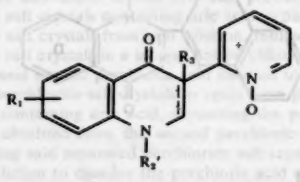
4,007,193

SUBSTITUTED 3-(2-PYRIDINYL)-4(1H)-QUINOLINONE N-OXIDES

David T. Connor, Parsippany; Patricia A. Young, Madison, and Maximilian von Strandtmann, Rockaway Township, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Sept. 8, 1975, Ser. No. 611,036
Int. Cl.² C07D 401/04
U.S. Cl. 260—288 CE **8 Claims**

1. A compound of the formula IV:



IV

wherein R_1 is hydrogen, halogen, 1 to 7 carbon lower alkyl, hydroxy or 1 to 7 carbon lower alkoxy; R_2 is 1 to 7 lower alkyl; R_3 is hydrogen or hydroxymethyl; and the pharmaceutically acceptable acid addition salts thereof.

5. A compound according to claim 1 which is 2,3-dihydro-1-methyl-3-(2-pyridinyl)-4(1H)-quinolinone N-oxide.

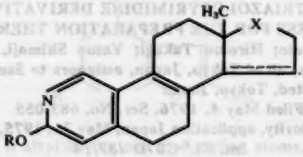
4,007,194

PROCESS AND INTERMEDIATES FOR MANUFACTURE OF 2-AZASTERIOIDS

Robert J. Chorvat, Arlington Heights, and Raphael Pappo, Skokie, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed May 6, 1974, Ser. No. 467,217
Int. Cl.² C07D 217/12
U.S. Cl. 260—289 AZ **6 Claims**

1. A dl-compound of the formula



wherein R is a lower alkyl group having 1–7 carbon atoms

inclusive, a tri(lower alkyl)silyl group wherein lower alkyl is a group having 1–7 carbon atoms inclusive or a lower cycloalkyl group having 5 or 6 carbon atoms, X is a carbonyl or β-hydroxymethylene group and the dotted line represents an optionally doubly-bonded linkage.

4,007,195

HETEROCYCLIC SUBSTITUTED FLUORANS

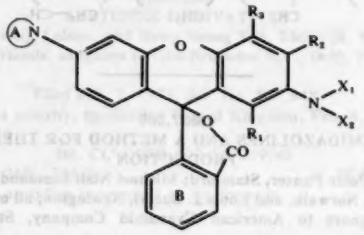
Robert Garner, Ramsbottom Bury, England, and Jean Claude Petitpierre, Kaiseraugst, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Division of Ser. No. 507,158, Sept. 18, 1974, Pat. No. 3,929,831. This application Sept. 30, 1975, Ser. No. 618,102

Int. Cl.² C07D *271/00*

U.S. Cl. 260—293.58 **6 Claims**

1. A fluoran compound of the formula



wherein

R_1, R_2 and R_3 independently of the other, represent hydrogen, alkyl with 1 to 4 carbon atoms, nitro or halogen, or R_2 and R_3 together complete a condensed carbocyclic ring,

X_1 and X_2 independently of the other, represent hydrogen, alkyl with 1 to 12 carbon atoms, alkenyl with at most 12 carbon atoms, alkoxyalkyl with 2 to 8 carbon atoms, alkoxycarbonylalkyl with 3 to 9 carbon atoms, cycloalkyl with 5 or 6 carbon atoms, acyl having 1 to 12 carbon atoms, or an unsubstituted or substituted benzyl, phenyl or naphthyl radical substituted by substituents selected from the group consisting of alkyl with 1 to 4 carbon atoms, alkoxy with 1 to 4 carbon atoms, alkoxycarbonyl with 2 to 5 carbon atoms, acyl having 1 to 4 carbon atoms, nitro, halogen or an amino optionally substituted by alkyl with 1 to 4 carbon atoms or by benzyl, and

the nitrogen ring A represents the piperidino radical and the benzene ring B is unsubstituted or substituted by nitro or 1 to 4 halogen atoms.

4,007,196

4-PHENYLPIPERIDINE COMPOUNDS

Jørgen Anders Christensen, Virum, and Richard Felt Squires, Gl. Olstykke, both of Denmark, assignors to A/S Ferrosan, Denmark

Continuation-in-part of Ser. No. 435,006, Jan. 21, 1974, Pat. No. 3,912,743. This application July 23, 1975, Ser. No. 598,146

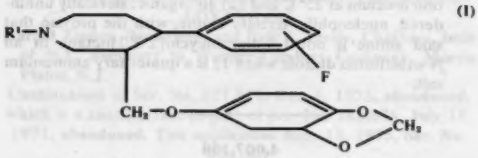
Claims priority, application United Kingdom, Jan. 30, 1973, 4496/73

The portion of the term of this patent subsequent to Oct. 14, 1992, has been disclaimed.

Int. Cl.² C07D *405/12*

U.S. Cl. 260—293.58 **4 Claims**

1. A 3-substituted 1-alkyl-4-fluorophenyl-piperidine of the formula



(I)

wherein R^1 represents hydrogen or an alkyl group of 1–4 carbon atoms;

the fluorine atom may be in any of the available positions; and a salt thereof with a pharmaceutically acceptable acid.

4,007,197

PROCESS FOR PREPARING PHOSPHOROTHIOATES AND PHENYLPHOSPHONOTHIOATES

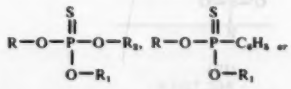
Harold H. Freedman, Newton Center, Mass.; Stanley D. McGregor; Masao Yoshimine, both of Midland, Mich., and Lorraine M. Kroposki, Walnut Creek, Calif., assignors to The Dow Chemical Company, Midland, Mich.

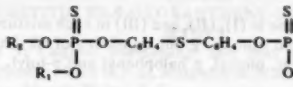
Filed June 10, 1975, Ser. No. 585,554

Int. Cl.² C07D *213/83*

U.S. Cl. 260—294.8 K **16 Claims**

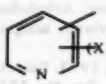
1. In the process of preparing a compound corresponding to the formula





wherein:

R_1 and R_2 are each independently lower alkyl; and

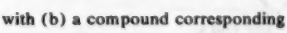


wherein:

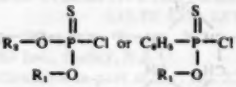
n is 0, 1, 2 or 3; and

X is nitro, cyano, halo, lower alkyl, lower alkoxy, lower alkylthio or lower alkylsulfinyl,

with the proviso that R does not bear more than one nitro group, lower alkylthio group or lower alkylsulfinyl group; by reacting in an inert liquid reaction medium under alkaline conditions (a) a compound corresponding to the formula



with (b) a compound corresponding to the formula



wherein M is an alkali metal and R, R_1 and R_2 have the aforesaid meaning;

the improvement consisting of conducting the process in the presence of a small but catalytic amount of (1) a quaternary ammonium or phosphonium salt having a minimum

solubility of at least 1 weight percent in the liquid reaction medium at 25° C and (2) an organic, sterically unhindered, nucleophilic tertiary amine, with the proviso that said amine is not 1,4-diazabicyclo[2.2.2]octane or an N-substituted diazole when 1) is a quaternary ammonium salt.

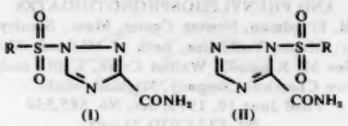
4,007,198

SUBSTITUTED 1,2,4-TRIAZOLE CARBOXAMIDE

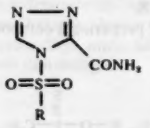
Howard Newman, Monsey, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Filed May 1, 1975, Ser. No. 573,687
Int. Cl.² C07D *249/10*; A61K *31/41*
U.S. Cl. 260—308 R **5 Claims**

1. Mixtures of 1-sulfonyl-s-triazole-3-carboxamide (I), 2-sulfonyl-s-triazole-3-carboxamide (II), and 4-sulfonyl-s-triazole-3-carboxamide (III) of the formulae:



(I) (II)



(III)

wherein R is the same in (I), (II), and (III) in each mixture and wherein R is selected from the group consisting of alkyl having 1 to 4 carbon atoms, phenyl, p halophenyl and p-tolyl.

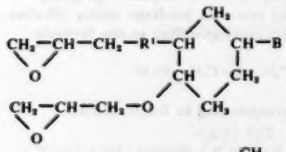
4,007,199

POLYGLYCIDYL COMPOUNDS CONTAINING N-HETEROCYCLIC STRUCTURE

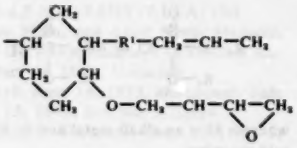
Jürgen Habermeier, Pfeffingen; Hans Batzer, Arlesheim, and Daniel Porret, Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 371,449, June 19, 1973, Pat. No. 3,900,493. This application July 7, 1975, Ser. No. 593,916
Claims priority, application Switzerland, June 23, 1972, 9528/72
Int. Cl.² C07D *49/32*
U.S. Cl. 260—309.5 **1 Claim**

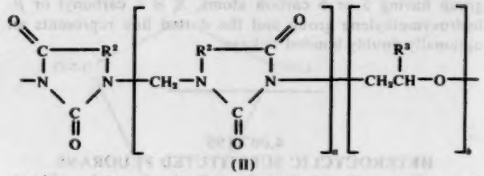
1. A polyglycidyl compound of the formula



(I)

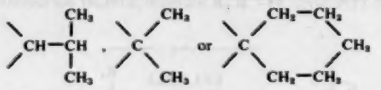


wherein B denotes the radical $-CH_2-O-CO-$, R^1 denotes a divalent radical of the formula



(II)

wherein *a* and *b* are identical or different and denote either 0 or 1;
R^3 is hydrogen or methyl;
and R^2 denotes one of the radicals



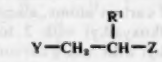
4,007,200

IMIDAZOLINES AND A METHOD FOR THEIR PRODUCTION

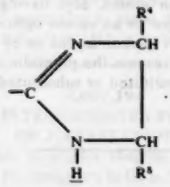
Hans Peter Panzer, Stamford; Michael Niall Desmond O'Connor, Norwalk, and Louis J. Baccei, Newington, all of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed May 6, 1974, Ser. No. 467,332
Int. Cl.² C07D *49/34*
U.S. Cl. 260—309.6 **2 Claims**

1. A compound having the formula



wherein Y is R^2O, R^2 being alkyl (C_1–C_{10}), R^1 is hydrogen or methyl and Z is



wherein *m* is 0 or 1, X is halogen and R^4 and R^5 are, individually, hydrogen, alkyl (C_1–C_4), aryl (C_6–C_{10}), aralkyl (C_7–C_{11}) or alkaryl (C_7–C_{11}).

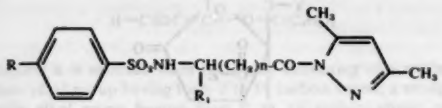
4,007,201

NOVEL PYRAZOLE DERIVATIVES

Tsutomu Irikura, Tokyo, Japan, assignor to Kyorin Pharmaceutical Co. Ltd., Tokyo, Japan

Filed May 30, 1975, Ser. No. 582,268
Int. Cl.² C07D *231/12*; A61K *31/415*
U.S. Cl. 260—310 R **5 Claims**

1. A compound of the general formula



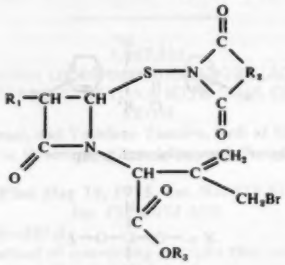
wherein
R is isobutyl, cyclohexyl or chlorine;
R_1 is hydrogen, methyl, phenyl or benzyl; and
n is 0 or 1 when R_1 is hydrogen and is 0 when R_1 is methyl, phenyl, or benzyl.

4,007,202
AZETIDINE DERIVATIVES

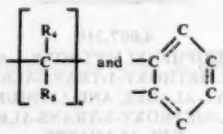
Jan Verweij, Leiden, and Hong Sheng Tan, Bleiswijk, both of Netherlands, assignors to Gist-Brocades N.V., Delft, Netherlands

Filed Feb. 7, 1975, Ser. No. 547,948
Claims priority, application United Kingdom, Feb. 8, 1974, 05811/74
Int. Cl.² C07D *207/12, 209/48*
U.S. Cl. 260—326 S **10 Claims**

1. An azetidine compound of the formula



wherein R_1 is a penicillin acylamido group, R_2 is selected from the group consisting of



wherein R_4 and R_5 are individually selected from the group consisting of hydrogen, lower alkyl and lower alkenyl, *n* is 2 and — in the case when R_2 is a phenyl this group may carry one to four substituents selected from the group consisting of halogen, lower alkyl, lower alkenyl and phenyl, and R_5 is lower alkyl optionally substituted with 1 or 2 phenyls which phenyl groups may be substituted with nitro and the dotted lines of the second formula indicate the optional presence of double bonds.

4,007,203
4-(1-PYROLIDENYL)-2H-1-BENZOTHIOPYRAN-3-CARBOXANILIDE

Harold Zinnes, Rockaway, and Neil A. Lindo, Chatham, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation of Ser. No. 421,556, Dec. 4, 1973, abandoned, which is a continuation-in-part of Ser. No. 163,076, July 15, 1971, abandoned. This application Aug. 13, 1975, Ser. No. 604,369
Int. Cl.² C07D *417/04*
U.S. Cl. 260—326.34 **1 Claim**

1. 4-(1-pyrrolidinyl)-2H-1-benzothiopyran-3-carboxanilide.

4,007,204
BENZOTHIOPHENE COMPOUNDS AND THE PRODUCTION AND USE THEREOF

Marcel Descamps, Crainhem, and Jean Gubin, Brussels, both of Belgium, assignors to Labaz, Paris, France

Filed Apr. 21, 1975, Ser. No. 569,819
Claims priority, application United Kingdom, June 6, 1974, 25256/74
Int. Cl.² C07D *333/52*
U.S. Cl. 260—330.5 **1 Claim**

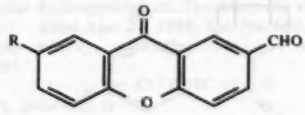
1. 2-Methyl-3-(3,5-dimethyl-4-γ-di-n-butylaminopropoxybenzoyl)-benzo[b]thiophene.

4,007,205
7-SUBSTITUTED-9-OXOXANTHENE-2-CARBOXALDEHYDES

David T. Connor, Parsippany, and Max von Strandtmann, Rockaway, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Mar. 16, 1976, Ser. No. 667,922
Int. Cl.² C07D *311/86*
U.S. Cl. 260—335 **3 Claims**

1. A compound of the formula:



I

in which R is lower alkoxy or hydroxy.

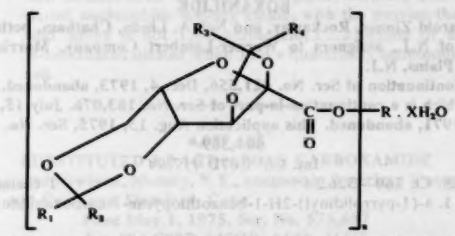
3. 9-hydroxy-7-methoxy-9H-xanthene-2-methanol.

4,007,206
2,3:4,6-DI-O(SUBSTITUTED)-2-KETO-L-GULONIC ACID, SALTS AND ESTERS

William Szkrybalo, Verona, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 335,607, Feb. 26, 1973, abandoned, which is a continuation-in-part of Ser. No. 277,538, Aug. 3, 1972, abandoned. This application Mar. 17, 1975, Ser. No. 559,209
Int. Cl.² C07D *319/06;* **A01N** *9/28*
U.S. Cl. 260—340.7 **11 Claims**

1. A compound represented by the formula



wherein, when *n* is 1, R is straight or branched chain alkyl of from 1 to 20 carbon atoms, straight or branched chain alkenyl of from 5 to 20 carbon atoms, straight or branched chain alkynyl of from 2 to 20 carbon atoms or halo-lower alkyl and, when *n* is 2, R is lower alkylene; R_1, R_2, R_3 and R_4 are hydrogen, straight or branched chain alkyl of from 1 to 7 carbon atoms, straight or branched chain alkenyl of from 2 to 7 carbon atoms, straight or branched chain alkynyl of from 2 to 7 carbon atoms, fluoro-lower alkyl, phenyl or phenyl having one or more substituents selected from the group consisting of alkyl, alkenyl, alkynyl, alkoxy and halo-lower alkoxy; *n* is an integer from 1 to 2 and X is a number from 0 to 11; its enantiomers and racemic mixtures, with the proviso that when R is alkyl of from 1 to 4 carbon atoms or alkenyl of from 5 to 6 carbon atoms, at least one of R_1, R_2, R_3 and R_4 is other than methyl.

4,007,207

ALKYL SUBSTITUTED-4-OXO-CYCLOPENTA BENZOPYRANS

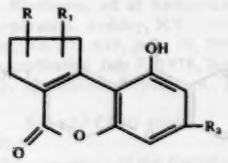
Martin Winn, Deerfield, Ill.; Raj Kumar Razdan, Belmont, Mass.; Haldean Cloyce Dalzell, Weston, Mass., and Joyce Ruth Krei, Glenview, Ill., assignors to Sharps Associates, Cambridge, Mass.

Division of Ser. No. 392,635, Aug. 29, 1973, Pat. No. 3,929,835. This application July 9, 1975, Ser. No. 594,534

Int. Cl.² C07D *311/78*

U.S. Cl. 260—343.2 R **6 Claims**

1. A compound of the formula



wherein R is a lower alkyl group having 1 to 5 carbons, R_1 is hydrogen or a lower alkyl group having 1 to 5 carbons and R_3 is an alkyl group having 1 to 20 carbon atoms, a phenyl-lower alkyl group or a cycloalkyl-lower alkyl group.

4,007,208

HYDROXYCITRIC ACID DERIVATIVES

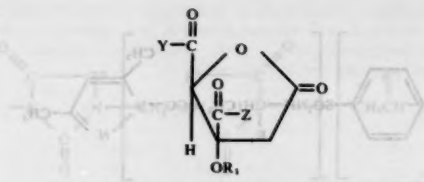
Robert William Guthrie, Fairfield, and Richard Wightman Kierstead, North Caldwell, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 376,478, July 5, 1973, Pat. No. 3,919,478, which is a division of Ser. No. 204,288, Dec. 2, 1971, Pat. No. 3,767,678. This application Aug. 1, 1975, Ser. No. 601,246

Int. Cl.² C07D *307/32*

U.S. Cl. 260—343.6 **7 Claims**

1. A compound of the formula



wherein R_1 is lower alkanoyl; Y is OR_2'; Z is OR_2; where R_2 is hydrogen; R_2' is lower alkyl or aryl lower alkyl; where aryl is selected from the group consisting of phenyl and phenyl monosubstituted with chlorine, bromine, iodine, fluorine, lower alkyl, hydroxy, lower alkoxy, nitro, cyano, carboxyl or alkanoyl-amino, wherein, alkanoyl is of up to 20 carbon atoms or an optical antipode or a pharmaceutically acceptable salt thereof.

4,007,209

ACETALS WHICH ACT AS PHOTOINITIATORS

Eckhard Hickmann, Ludwigshafen; Martin Fischer, Ellerstadt; Otto Volkert, and Mong-Jon Jun, both of Ludwigshafen, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengeselischaft, Ludwigshafen (Rhine), Germany

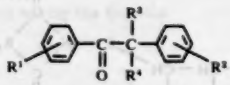
Continuation of Ser. No. 375,176, June 29, 1973, abandoned. This application Mar. 10, 1975, Ser. No. 557,046

Claims priority, application Germany, July 1, 1972, 2232497

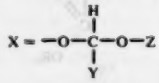
Int. Cl.² C07D *309/08*

U.S. Cl. 260—345.9 **5 Claims**

1. Acetals of benzoin compounds which act as photoinitiators and which have the formula



which contain at least one acetal group



in the radicals R^3 or R^4, Y being CH_3 and Z being C_2–C_4-alkyl, or Y and Z together forming a propylene or butylene group; R^1 and R^3 are H, C_1–C_4-alkyl, C_1–C_4-alkoxy or Cl, R^3 is H, CH_3, CH_2OR^5 or CH_2X, R^4 is X or OR^5 and R^5 is C_1–C_6-alkyl.

4,007,210

NOVEL 3-TRIPHENYLMETHOXY-1-ALKYNES, 3-TRIPHENYLMETHOXY-1-TRANS-ALKENYL-DIALKYL-ALANES, AND LITHIUM 3-TRIPHENYL-METHOXY-1-TRANS-ALKENYL-DIALKYL-ALANATES

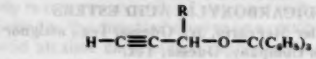
Karel Francis Bernady; Middleton Brawner Floyd, Jr., both of Suffern; John Frank Poletto, Nanuet, all of N.Y.; Robert Eugene Schaub, Upper Saddle River, and Martin Joseph Weiss, Oradell, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 355,350, April 27, 1973, Pat. No. 3,932,479. This application Sept. 18, 1975, Ser. No. 613,776

Int. Cl.² C09B *11/06*

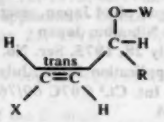
U.S. Cl. 260—395 **13 Claims**

1. Compounds of the formula:



wherein R is selected from the group consisting of a straight chain alkyl group having from 2 to 10 carbon atoms, a straight chain alkyl group having from 2 to 10 carbon atoms and substituted with one or two alkyl groups each having from one to three carbon atoms, a straight chain alkenylmethyl group having from 3 to 10 carbon atoms and a straight chain alkenylmethyl group having from 3 to 10 carbon atoms and substituted with one or two alkyl groups having between them 2 to 5 carbon atoms.

7. Compounds of the formula:



wherein X is iodo or bromo; R is a straight chain alkyl group having from 2 to 10 carbon atoms, a straight chain alkyl group having from 2 to 10 carbon atoms and substituted with one or two alkyl groups having from 1 to 3 carbon atoms, a straight chain alkenylmethyl group having from 3 to 10 carbon atoms, or a straight chain alkenylmethyl group having from 3 to 10 carbon atoms and substituted with one or two alkyl groups having between them 2 to 5 carbon atoms; and W is lower alkyl, triphenylmethyl, or triphenylmethyl wherein one or two of the phenyl rings is substituted with a lower alkoxy group.

4,007,211

CONVERSION OF ORGANIC CARBOXYLIC ACID TO CORRESPONDING KETONE WITH LOSS OF CARBON ATOM

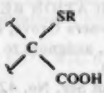
Barry M. Trost, and Yoshinao Tamaru, both of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed May 19, 1975, Ser. No. 578,533

Int. Cl.² C07J 5/00

U.S. Cl. 260—397.3 **19 Claims**

1. The method of converting an alpha thio carboxylic acid compound having the general formula



to the corresponding ketone having the general formula

wherein the carboxylic carbon is removed and in which R is an organic group other than an alkenyl or alkynyl group comprising subjecting the alpha thio carboxylic acid compound to oxidative decarboxylation by reaction of the alpha thio carboxylic acid compound with a positive halogen source.

4,007,212

NOVEL AMIDE COMPOUNDS

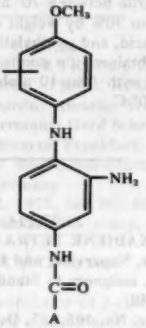
Harris L. Curtis, Needham, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 20,482, March 26, 1970, Pat. No. 3,923,779, which is a continuation of Ser. No. 655,304, July 24, 1967, abandoned. This application Apr. 28, 1975, Ser. No. 572,073

Int. Cl.² C07C 103/44

U.S. Cl. 260—404.5 **5 Claims**

1. A compound of the formula:



wherein:

X is methyl, methoxy, hydroxy, amino, chloro, or carboxy;

m is a positive integer from 1 to 2; and

A is an alkyl radical having from 9–17 carbon atoms.

4,007,213

PROCESS FOR PREPARING 1-(N-β-CYANETHYLAMINOL-3-ACYLAMINOBENZENES

Rudolf Schickfluss, Frankfurt am Main, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

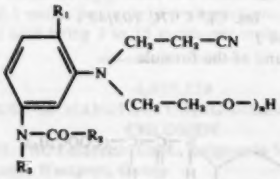
Filed Apr. 27, 1976, Ser. No. 680,706

Claims priority, application Germany, Apr. 29, 1975, 2519002

Int. Cl.² C07C 121/78

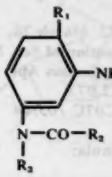
U.S. Cl. 260—465 D **4 Claims**

1. Process for the manufacture of 1-(N-β-cyanethylamino)-3-acylaminobenzenes of the formula (1)



(1)

in which R_1 represents hydrogen, methyl or alkoxy of 1 to 4 carbon atoms, R_2 represents hydrogen, alkyl from 1 to 3 carbon atoms or phenyl, R_3 represents hydrogen or alkyl from 1 to 3 carbon atoms, and *n* represents the integer 0 or 1, which comprises reacting 1 mole of an amine of the formula (2)



(2)

in which R_1, R_2 and R_3 are defined as above, with 1 to 1.75 moles of acrylonitrile between 70° and 150° C in water with the addition of 1 to 30% by weight of an organic carboxylic acid or carbonic acid, and oxethylating the compound of the said formula (1) obtained, if *n* stands for the integer 0, without or after isolation, with 1 to 10 moles of ethylene oxide between 50° and 100° C.

4,007,214

DICYCLOHEXADIENE TETRAACYL COMPOUNDS

Steven A. Cerefice, Naperville, and Ellis K. Fields, River Forest, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 405,837, Oct. 12, 1973, Pat. No. 3,929,711. This application June 6, 1975, Ser. No. 584,638

Int. Cl.² C07C *69/74*

U.S. Cl. 260—468 G **4 Claims**

1. A tetra ester of a dicyclohexadiene tetracarboxylic acid selected from the group consisting of tricyclo [6.2.2.$0^{2,7}$]dodeca-3,9-diene-5,6,11,12-tetracarboxylic acid and tricyclo [6.2.2.$0^{2,7}$]dodeca-4,9-diene-5,6,11,12-tetracarboxylic acid wherein the ester moieties of said tetra ester are selected from at least one member of the class consisting of alkyl groups containing from 1 to 24 carbon atoms, aryl groups containing from 6 to 24 carbon atoms, aralkyl groups containing from 7 to 24 carbon atoms and alkenyl groups containing from 3 to 24 carbon atoms.

4,007,215

1-(BIS-ETHOXYCARBONYL)-ACETYLAMINO-3-METHYL-3-(BIS-ETHOXYCARBONYL)-ACETYLAMINOMETHYL-5-DIMETHYL-CYCLOHEXANE

Heinrich Hartmann, Limburgerhof, and Wolfgang Druschke, Dirmstein, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

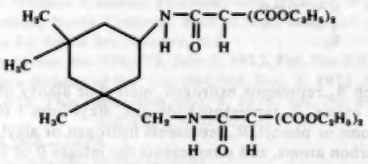
Filed July 7, 1975, Ser. No. 593,762

Claims priority, application Germany, July 31, 1974, 2436872

Int. Cl.² C07C *103/48*

U.S. Cl. 260—468 J **1 Claim**

1. The compound of the formula



4,007,216

2-METHOXY-4-METHYL-3-OXO-CYCLOPENT-1-ENE-1,4-DICARBOXYLIC ACID ESTERS

Thurman Chestler McFearin, Jr., Odessa, Tex., assignor to El Paso Products Company, Odessa, Tex.

Division of Ser. No. 426,021, Dec. 19, 1973, Pat. No. 3,922,296. This application May 12, 1975, Ser. No. 576,742

Int. Cl.² C07C *69/74*

U.S. Cl. 260—468 K **1 Claim**

1. As a composition of matter 2-methoxy-3,5-dicarboalkoxy-5-methylcyclopent-2-ene-1-one.

4,007,217

PROCESS FOR PRODUCING 2-HYDROXY-3-BUTENOIC ACID DERIVATIVES

Katsura Kogure, Kawagoe; Noriyoshi Sueda, Tokyo; Sizuo Himoto, Kawagoe; Youziro Yoshino, Tokyo, and Kunio Nakagawa, Kawagoe, all of Japan, assignors to Nisshin Flour Milling Co., Ltd., Nihonba, Japan

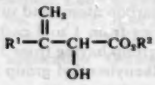
Filed July 28, 1975, Ser. No. 599,776

Claims priority, application Japan, July 27, 1974, 49-85621

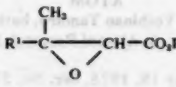
Int. Cl.² C07C *69/76*

U.S. Cl. 260—473 A **4 Claims**

1. A process for producing a 2-hydroxy-3-butenoic acid ester of the general formula,



wherein R^1 is a radical selected from the group consisting of aliphatic, alicyclic and aromatic radicals and R^2 is a lower alkyl group, which comprises reacting in the absence of water and in the presence of inorganic or organic acid selected from the group consisting of sulfuric acid, hydrochloric acid, phosphoric acid and p-toluenesulfonic acid, a glycidic acid ester derivative of the general formula,



wherein R^1 and R^2 are as defined above and forming said 2-hydroxy-3-butenoic acid ester.

4,007,218

ESTERIFICATION REACTION

Ibrahim Ghanayem, Downers Grove, and Alvin E. Trevillyan, Naperville, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 422,676, Dec. 7, 1973, abandoned. This application July 31, 1975, Ser. No. 600,858

Int. Cl.² C07C *69/44, 69/50, 69/76, 69/80*

U.S. Cl. 260—475 R **9 Claims**

1. The process of producing relatively pure esters, which comprises reacting a solution of at least one organic polycarboxylic acid compound selected from the group consisting of phthalic acid, phthalic anhydride, isophthalic acid, terephthalic acid, 2,5-dibromoterephthalic acid, trimellitic anhydride, trimellitic acid, adipic acid, adipic anhydride, and sebacic acid in the presence of a tetraalkyl titanate esterification catalyst in excess monohydroxy hydrocarbon compounds selected from the group consisting of alcohols containing from 1 to 24 carbon atoms and aromatic hydroxy compounds containing 6 to 18 carbon atoms to produce a monohydroxy solution of organic ester, treating the dissolved organic ester in the substantial absence of unbound water at a temperature of at least 120° C with at least one solid alkaline earth metal

compound selected from the group consisting of alkaline earth metal oxide and alkaline earth metal hydroxide, adding subsequently two to twenty mols of water per mol of alkaline earth compound to the dissolved ester at up to 100° C and partitioning solid alkaline earth metal compound from the dissolved organic ester, wherein the concentration of alkaline earth metal compound is 0.1 to 35 equivalents per equivalent of acid material in the monohydroxy solution of organic ester.

4,007,219

BENZOPHENONE GLYCINAMIDE DERIVATIVES

Cedric Herbert Hassall, Welwyn; William Henry Johnson, Hitchin; Antonin Krohn, London; Carey Ernest Smithen, Welwyn, and William Anthony Thomas, Huntingdon, all of England, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

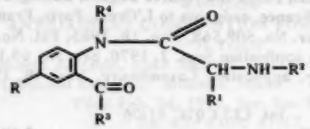
Filed Aug. 18, 1975, Ser. No. 605,580

Claims priority, application United Kingdom, Aug. 20, 1974, 36567/74; May 21, 1975, 21821/75; Aug. 11, 1975, 36567/75

Int. Cl.² C07C *103/28, 103/127, 103/30*; A61K *31/165*

U.S. Cl. 260—501.17 2 Claims

1. A compound of the formula



wherein R is selected from the group consisting of a halogen atom, nitro and a trifluoromethyl group; R^1 is a hydrogen atom or a lower alkyl group; R^2 is an acyl group derived from a naturally occurring amino acid; R^3 is selected from the group consisting of phenyl and halophenyl; and R^4 is selected from the group consisting of a hydrogen atom, a methyl, cyclopropylmethyl, di(C_{1-4} alkyl) aminoethyl, methoxymethyl and a hydroxyethyl group and the acid addition salts thereof.

4,007,220

PREPARATION OF PHTHALALDEHYDIC ACID FROM α,α,α,α',α'-PENTACHLORO-O-XYLENE

Giorgio Montorsi, Milan; Renato Pellizzato, Varese, and Anacleto Gianantonio, Milan, all of Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

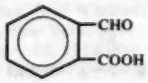
Filed Aug. 13, 1975, Ser. No. 604,293

Claims priority, application United Kingdom, Sept. 20, 1974, 40984/74

Int. Cl.² C07C *63/04*

U.S. Cl. 260—515 R 4 Claims

1. A process for preparing phthalaldehydic acid having the formula



by heating at a temperature between about 80° and about 180° C a mixture of α,α,α,α',α'-pentachloro-o-xylene and at least 0.1 part by weight of phthalaldehydic acid per part by weight of said pentachloroxylene as the sole catalyst in at least the stoichiometric amount of water necessary to hydrolyze said pentachloroxylene for a time sufficient to hydrolyze said pentachloroxylene to phthalaldehydic acid.

4,007,221

MANUFACTURE OF NUCLEAR-IODINATED IODINE COMPOUNDS OF AROMATIC CHARACTER

Hans Urbach, Lampertheim, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Jan. 16, 1976, Ser. No. 649,580

Claims priority, application Germany, Jan. 29, 1975, 2503504

Int. Cl.² C07C *51/01, 79/12*; C07B *9/00*

U.S. Cl. 260—515 A 10 Claims

1. In a process for the manufacture of an aromatic nuclear-iodinated iodine compound by reacting an aromatic diazonium salt with hydriodic acid or a salt thereof, the improvement which comprises carrying out the reaction in aqueous solution and in the presence of a reducing agent.

4,007,222

PROCESS FOR THE PRODUCTION OF 2-CHLOROCAPROIC ACIDS

Heinz Haschke, Weissenstein, Austria; Wolfgang Leuchtenberger, Bruchkobel, Germany; Gerd Schreyer, Hanau, Germany, and Werner Schwarze, Frankfurt, Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany

Filed Aug. 22, 1975, Ser. No. 607,051

Claims priority, application Germany, Aug. 22, 1974, 2440213

Int. Cl.² C07B *9/00*

U.S. Cl. 260—518 A 12 Claims

1. A process for the production of 2-chloro-n-caproic acid or 6-substituted-2-chloro-n-caproic acid from (1) n-caproic acid or (2) 6-substituted n-caproic acid wherein the substituent is an acylamino where the acyl is the acyl of a carboxylic acid, phthalimido, p-toluenesulfonamido, benzenesulfonamido, —NH—CO—$N(CH_2)_5$—COOH, —NH—CS—NH—$(CH_2)_5$—COOH, chlorine or bromine comprising chlorinating in the presence of a sulfur chloride, sulfur bromide, phosphorus chloride or phosphorus bromide as a catalyst at 110° to 130° C., using up to 1.2 mole of chlorine per mole of (1) or (2) as the chlorinating agent.

4,007,223

METHOD OF PREPARING P-NITROBENZOIC ACID

Marcel Feld, Porz-Wahn, and Hermann Richtzenhain, Much-Schwellenbach, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Cologne, Germany

Filed Dec. 23, 1974, Ser. No. 535,862

Claims priority, application Germany, Dec. 29, 1973, 2365131

Int. Cl.² C07C *51/33*

U.S. Cl. 260—524 R 17 Claims

1. Process of preparing p-nitrobenzoic acid of high purity by oxidation of p-nitrotoluene with oxygen, which comprises contacting the oxygen with the p-nitrotoluene in an acetic acid reaction medium and in the presence of a cobalt-containing and bromine-containing catalyst for the oxidation, at a temperature of 80° to 150° C for a time sufficient for the oxidation, the cobalt being present as a cobalt salt in the amount of 0.01 to 0.1 moles per mole of p-nitrotoluene, and the amount of acetic acid being 3 to 15 moles per mole p-nitrotoluene.

4,007,224

PROCESS OF MANUFACTURING DICHLOROACETYL CHLORIDE

Harold M. Pitt, Lafayette, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 494,671, Aug. 5, 1974, abandoned. This application Mar. 5, 1975, Ser. No. 553,936

Int. Cl.² C07G *51/58*

U.S. Cl. 260—544 Y 8 Claims

1. In a process for producing dichloroacetyl chloride comprising reacting trichloroethylene in the liquid phase with an

oxygen containing gas in the presence of a catalytic amount of free chlorine or bromine and a chlorine activating source to form a mixture of dichloroacetyl chloride and trichloroethylene oxide, and then treating said mixture with a catalytically effective amount of an amine catalyst to cause rearrangement of the trichloroethylene oxide to dichloroacetyl chloride, the improvement comprising continuously contacting the reaction mixture of trichloroethylene and oxygen during the oxidation of the trichloroethylene with an amide catalyst selected from the group of primary alkyl amides and secondary alkyl amides, in which the alkyl groups contain from 1 to 6 carbon atoms to effect continuous rearrangement of trichloroethylene oxide formed to dichloroacetyl chloride.

4,007,225

4-BENZOYLINDAN-1-CARBOXAMIDE AND DERIVATIVES THEREOF

Shunsaku Noguchi, Osaka; Tetsuya Aono, Kyoto; Yoshiaki Araki, Osaka, and Kiyohisa Kawai, Kyoto, all of Japan, assignors to Takeda Chemical Industries, Ltd., Japan

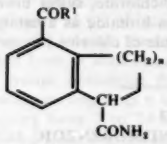
Division of Ser. No. 496,855, Aug. 12, 1974, Pat. No. 3,953,500. This application Jan. 9, 1976, Ser. No. 647,810

Claims priority, application Japan, Aug. 11, 1973, 48-90274; Sept. 1, 1973, 48-98371; Sept. 13, 1973, 48-103602; Sept. 13, 1973, 48-103604; Sept. 13, 1973, 48-103605; Sept. 13, 1973, 48-103606; Oct. 31, 1973, 48-122490; May 7, 1974, 49-51034; May 24, 1974, 49-59017; May 31, 1974, 49-62300

Int. Cl.² C07C *103/22, 103/28;* A61K *31/165*

U.S. Cl. 260—558 R **9 Claims**

1. A compound of the formula



wherein R^1 is phenyl which is unsubstituted or substituted by lower alkyl having 1 to 4 carbon atoms, lower alkoxy having 1 to 4 carbon atoms, halogen, mono- or di-alkylamino having 1 to 3 carbon atoms, acetylamino, or propionylamino and n is 1 or 2.

4,007,226

NITRILE HYDROGENATION PROCESS

Jefferson W. Reynolds, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 59,368, July 29, 1970, Pat. No. 3,728,284. This application Jan. 31, 1973, Ser. No. 328,211

Int. Cl.² C07C *85/10, 87/14*

U.S. Cl. 260—563 D **6 Claims**

1. A process for the preparation of primary and secondary amines which comprises subjecting a monomeric nitrile of the formula R(C N)$_n$ wherein R is a hydrocarbon radical of 1 to 18 carbons and n is a number of 1 to 4, to hydrogenation with a gas consisting essentially of hydrogen at a temperature of about 50° to 135° C. and a pressure of about 250 to 3000 psi in the presence of a hydrogenation catalyst comprising nonsintered macrosize particles of a hydrogen-reduced mixture of sodium silicate and an oxide of cobalt wherein the weight ratio of sodium silicate to the oxide of cobalt, figured as CoO, is from about 1:1 to about 1:9.

4,007,227

CERTAIN OXIME COMPOSITIONS AND THEIR USE IN CONTROLLING FUNGI

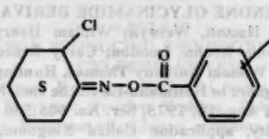
Don R. Baker, Orinda, and Arnold D. Gutman, Berkeley, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 330,764, Feb. 8, 1973, Pat. No. 3,885,043, which is a continuation of Ser. No. 875,576, Nov. 10, 1969, abandoned. This application Feb. 28, 1975, Ser. No. 554,288

Int. Cl.² C07C *131/02, 131/04, 131/06*

U.S. Cl. 260—566 AE **6 Claims**

1. A compound having the formula



wherein R^1 is chlorine or bromine.

4,007,228

SUBSTITUTED-2-NITRO-PARAPHENYLENEDIAMINES AND PROCESSES FOR PRODUCING SAME

Gregoire Kalopissis, Paris, and Andree Bugaut, Boulogne-sur-Seine, both of France, assignors to L'Oreal, Paris, France

Division of Ser. No. 508,568, Nov. 18, 1965, Pat. No. 3,555,584. This application Sept. 2, 1970, Ser. No. 69,116

Claims priority, application Luxembourg, Nov. 19, 1964, 47386

Int. Cl.² C07C *91/06*

U.S. Cl. 260—573 **3 Claims**

1. (2'-hydroxyethyl)-1-amino-2-nitro-(2'-hydroxyethyl)-4-methylamino benzene.

4,007,229

PREPARATION OF HYDROXYALKYL PHOSPHINE OXIDES AND SULFIDES

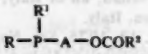
Ingenuin Hechenbleikner, West Cornwall, Conn., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Feb. 12, 1975, Ser. No. 549,405

Int. Cl.² C07F *9/53;* B01J *1/10*

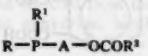
U.S. Cl. 260—606.5 P **9 Claims**

1. A process for the preparation of hydroxyalkylphosphine oxides and sulfides comprising the steps of (1) alcoholysis and (2) oxidation, of an ester-substituted phosphine having the structural formula:



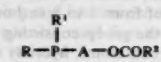
where R and R^1 are hydrogen, alkyl, aryl, cycloalkyl, aralkyl or A—OCOR², A is ethylene or propylene, and R^2 is alkyl of 2–17 carbon atoms.

2. A process for the preparation of hydroxyalkylphosphine oxides and sulfides comprising the steps of (1) hydrolysis and (2) oxidation, of an ester-substituted phosphine having the structural formula:



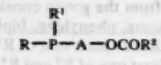
where R and R^1 are hydrogen, alkyl, aryl, cycloalkyl, aralkyl or A—OCOR², A is ethylene or proylene, and R^2 is alkyl of 2–17 carbon atoms.

6. A process for the preparation of hydroxyalkylphosphine oxides and sulfides comprising the steps of (1) oxidation and (2) alcoholysis, of an ester-substituted phosphine having the structural formula:



where R and R^1 are hydrogen, alkyl, aryl, cycloalkyl, aralkyl or A—$OCOR^2$, A is ethylene or propylene, and R^2 is alkyl of 2–17 carbon atoms.

7. A process for the preparation of hydroxyalkylphosphine oxides and sulfides comprising the steps of (1) oxidation and (2) hydrolysis, of an ester-substituted phosphine having the structural formula:



where R and R^1 are hydrogen, alkyl, aryl, cycloalkyl, aralkyl or A—$OCOR^2$, A is ethylene or propylene, and $R^2$is alkyl of 2–17 carbon atoms.

4,007,230

ANTIOXIDANT COMPOSITION FOR STABILIZING POLYOLS

Kenneth J. Hinze, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Feb. 24, 1975, Ser. No. 552,095

Int. Cl.² C07C *41/12*

U.S. Cl. 260—611.5 **9 Claims**

1. A polyether polyol or mixture of such polyols containing as a stabilizer against oxidative degradation from about 500 to about 100,000 ppm of an antioxidant composition containing:

A. from about 15 to about 85 percent by weight of a phenolic antioxidant selected from the group consisting of

2,4-dimethyl-6-octyl phenol,
2,6-ditertiarybutyl-4-methyl phenol,
2,6-ditertiarybutyl-4-ethyl phenol,
2,6-ditertiarybutyl-4-n-butyl phenol,
2,2′-methylenebis (4-methyl-6-tertiarybutyl phenol),
2,2′-methylenebis (4-ethyl-6-tertiarybutyl phenol),
2,4-dimethyl-6-tertiarybutyl phenol,
4-hydroxymethyl-2,6-ditertiarybutyl phenol, n-octadecyl-beta (3,5-ditertiarybutyl-4-hydroxyphenyl)propionate,

and mixtures thereof;

B. from about 85 to about 15 percent by weight of 4,4′-bis-(α,α-dimethylbenzyl)diphenylamine;

and wherein said polyether polyol contains from 2 to about 8 hydroxyl groups and has a molecular weight of from about 250 to about 10,000.

4,007,231

SELECTIVE PRODUCTION OF PARA-XYLENE

Stephen Allan Butter, East Windsor, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 24, 1975, Ser. No. 634,992

Int. Cl.² C07C *15/08, 3/62;* B01J *29/36*

U.S. Cl. 260—672 T **6 Claims**

1. A process for the selective production of para-xylene which comprises contacting toluene under disproportionation conditions, with a catalyst comprising a composite of a crystalline aluminosilicate zeolite and antimony oxide, said zeolite having a silica to alumina ratio of at least about 12 and a constraint index within the approximate range of 1 to 12, collecting the resultant product and separating para-xylene therefrom.

4,007,232

ACRYLIC SYNTHETIC FIBER SUPERIOR IN NON-INFLAMMABILITY

Taoru Yamazaki, Akashi; Shiyunichiro Kurioka; Takashi Hatano, both of Kobe; Yukihiro Higashiyama, and Sadame Asada, both of Takasago, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 23, 1975, Ser. No. 643,811

Claims priority, application Japan, Dec. 23, 1974, 50-1374; Dec. 23, 1974, 50-1373; Jan. 9, 1975, 50-5392; Jan. 29, 1975, 50-12663

Int. Cl.² C08K *3/22*

U.S. Cl. 260—836 **7 Claims**

6. An acrylic synthetic fiber comprising an acrylic copolymer consisting essentially of a mixture of olefinic monomers (A) excluding monomers having dyeable sites in their molecular structure and mainly comprising acrylonitrile, said acrylonitrile being in an amount of from 40 to 65 weight percent of said copolymer, vinyl chloride and vinylidene chloride in amounts within the range defined by the following

$$102.8 < A + B + 1.29C < 107.4$$

wherein A is in weight percents, B is the weight percent of vinyl chloride and C is the weight percent of vinylidene chloride, and 0.2 to 20 weight percent of homopolymer or copolymer of glycidyl methacrylate.

4,007,233

RUBBER CEMENT COMPOSITIONS

Yuji Kako, Shizuoka; Toyoji Kikuga, and Akira Toko, both of Fujieda, all of Japan, assignors to Sumitomo Durez Company, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 322,265, Jan. 9, 1973, abandoned. This application Oct. 30, 1974, Ser. No. 519,314

Int. Cl.² C08L *61/10, 61/12*

U.S. Cl. 260—845 **10 Claims**

1. In a rubber cement composition comprising nitrile rubber and a phenolic resin derived from a mono-hydroxyphenol, the improvement wherein the phenolic resin consists essentially of phenolic resin produced by (a) condensing a bifunctional phenol and an aldehyde in a molar ratio of about 0.5 to 3 moles of aldehyde per mole of bifunctional phenol under alkaline conditions, and (b) reacting the resulting condensation product with a polyfunctional phenol having at least 3 reactive positions on the phenyl nucleus in a molar ratio of about 0.05 to 2.5 moles of polyfunctional phenol per mole of bifunctional phenol in said condensation product in the presence of a sufficient amount of acid to provide acid catalysis of the condensation of the aldehyde and the phenol, to produce a phenolic resin having a number average molecular weight of about 700 to 1,900 and a melting point of about 80° to 160° centigrade.

4,007,234

PROCESS FOR PREPARING IMPACT RESISTANT STYRENE POLYMERS

Horst-Dieter Schuddemage, Florsheim, Horst Jastrow, Niederhochstadt, and Harry Barth, Frankfurt am Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed June 26, 1975, Ser. No. 590,571

Claims priority, application Germany, June 28, 1974, 2431125

Int. Cl.² C08J *3/24;* C08F *255/06*

U.S. Cl. 260—878 R **7 Claims**

1. Process for preparing impact resistant styrene graft copolymers by a mass or suspension polymerization initiated thermally or by monomer soluble initiators of

(a) 98 to 70% by weight of a mixture of

aa. 90 to 70% by weight of a monomer selected from styrene, α-methyl styrene, styrene methylated in the

nucleus, styrene halogenated in the nuleus, vinyl cyclohexane, methylated derivatives of vinyl cyclohexane, halogenated derivatives of vinyl cyclohexane and mixtures of styrene with a foregoing monomer with

ab. 10 to 30% by weight of a monomer selected from acrylonitrile, acrylic acid esters, substituted acrylonitriles, substituted acrylic acid esters and mixtures of such monomers with

b. 2 to 30% by weight of an ethylene/propylene/tertiary component rubber (EPTR), the quantities (aa) and (ab) being calculated on the total quantity of monomers and the quantities (a) and (b) being calculated on the total quantity of monomers and rubber, which comprises adding prior to or during polymerization an organic peroxide and submitting the polymer obtained to a two-step extrusion, whereby rubber particles of a size of less than 1 μ are prepared by product shearing in the melt in the first step at temperatures of 130° to 240° C. and a cross-linking of the rubber particles is carried out in the second step at temperatures of 200° to 280° C, the quantity, half life and moment of addition of the peroxide as well as the polymerization and shearing temperatures being so selected that after the termination of the shearing a quantity of peroxide sufficient for cross-linking the polymer is still present in the polymer, said quantity of peroxide being in the range of about 0.05 to about 0.5% by weight calculated on the total quantity of monomers and rubber.

4,007,235

METHOD OF PREPARING VINYL HALIDE POLYMERS AND COPOLYMERS WITH POLYOLEFINS

Leigh E. Walker, Lewiston, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Jan. 15, 1975, Ser. No. 541,163

Int. Cl.² C08F *255/2, 255/4, 255/6, 255/10*

U.S. Cl. 260—878 R **11 Claims**

1. In the process for the preparation of a vinyl halide polymer which comprises polymerizing in bulk a vinyl halide monomer, in liquid phase, either alone or in combination with up to about 50% by weight of another ethylenically unsaturated monomer copolymerizable therewith in the initial presence of more than about 3.5% by weight based on said vinyl halide monomer of a polyolefin or mixture of polyolefins having a weight average molecular weight of at least about 50,000, the improvement which comprises removing from the polymerization mass during the thick paste state thereof from about 2% to less than about 50% by weight of the vinyl halide charged to the polymerization mass, the effective concentration of said polyolefin after said vinyl halide removal being above about 5.3 weight percent based on vinyl halide remaining in said polymerization mass after said removal of vinyl halide whereby a more finely divided particulate product of high impact strength is obtained.

4,007,236

BROMINATED PHOSPHORAMIDATES

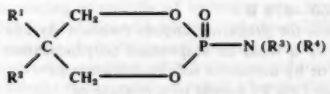
James J. Duffy, Tonawanda; Richard D. Carlson, Grand Island, both of N.Y., and James C. Watson, Florence, S.C., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Dec. 31, 1974, Ser. No. 537,742

Int. Cl.² C07F *9/15*

U.S. Cl. 260—927 R **8 Claims**

1. Brominated phosphoramidates of the structure

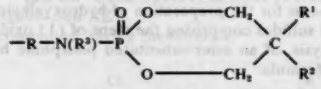


wherein:

R^1 and R^2 are independently selected from the group consisting of hydrogen, chloro, bromo and chloro or bromo substituted alkyl of from 1 to 8 carbon atoms;

R^3 is selected from the group consisting of hydrogen, alkyl of from 1 to 8 carbon atoms, hydroxy substituted alkyl of from 1 to 8 carbon atoms and chloro or bromo substituted alkyl of from 1 to 8 carbon atoms;

R^4 is a group of the structure



wherein R is selected from the group consisting of alkylene of from 2 to 8 carbon atoms, phenylene, biphenylene and dicycloheylene provided that at least one of R^1 and R^2 contains a bromine atom and at least one of R^3 and R^4 contains a replaceable hydrogen.

4,007,237

COMPENSATION APPARATUS FOR CARBURETOR

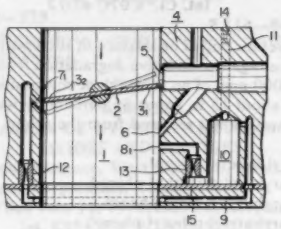
Norihiko Nakamura, Mishima, and Hiromichi Yanagihara, Susono, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Aug. 25, 1975, Ser. No. 607,447

Claims priority, application Japan, Apr. 19, 1975, 50-048023

Int. Cl.² F02M *7/06*

U.S. Cl. 261—41 D **9 Claims**



1. In a carburetor having wall means defining an air intake passage, a throttle member positioned within said intake passage and mounted for swinging movement about an axis which is substantially transverse to said passage, and a fuel supply port communicating with said intake passage in the vicinity of said throttle member, the improvement comprising compensating means for supplying additional fuel to said intake passage when the throttle member is moved into a preselected position to attain a more desirable fuel-air ratio in a transitional region between different operational conditions, said compensating means including:

a first opening formed in said wall means and communicating with said intake passage near the edge of said throttle member, said first opening being positioned upstream or downstream of said throttle member depending on the degree of opening thereof, the first opening being upstream of the throttle member when the throttle member is moved into said preselected position;

a second opening provided in said wall means and communicating with said intake passage, said second opening being positioned downstream of said throttle member at least when said throttle member is in said preselected position;

an intermediate fuel supply chamber formed in said wall means;

fuel supply passage means communicating with said intermediate fuel supply chamber for supplying fuel thereto and for maintaining a quantity of fuel therein;

a first connecting passage joining said first opening to said intermediate fuel supply chamber, and a second connecting passage joining said intermediate fuel supply chamber to said second opening, said first and second connecting passages being isolated from one another by the fuel within said intermediate chamber so that direct flow of air from said first passage into said second passage is prevented;

whereby when said throttle member is in said preselected position, the pressure upstream of the throttle member is greater than the pressure downstream of the throttle member so that the pressure differential which exists between the first and second openings causes fuel within said intermediate chamber to be discharged through said second opening into said air intake passage.

4,007,238

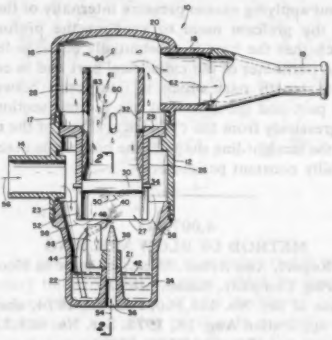
NEBULIZER FOR USE WITH IPPB EQUIPMENT

Joseph G. Glenn, Rte. 1 Box 1221, Broken Arrow, Okla. 74012

Filed Feb. 25, 1976, Ser. No. 661,366

Int. Cl.² A61M *15/00, 11/06*

U.S. Cl. 261—78 A **4 Claims**



1. A nebulizer for use with IPPB appartus comprising:

a. a cylindrical housing with axis vertical, an air inlet tube extending horizontally through the wall of said housing;

b. top closure means closing the top end of said housing, an outlet tube passing through the wall of said top closure means;

c. a bottom cup removably attached to said housing for closing the bottom end of said housing, and storing a supply of liquid medication; a post in the base of said cup, an opening through said post, and an orifice closing the top end of said opening;

d. means to supply air under pressure to said nozzle to create a vertical jet of air;

e. capillary tube means attached to said post, the bottom end immersed in liquid medication in said cup, the top end fixed in position in said air jet, whereby the flow of air will cause liquid to be drawn up inside said capillary and to form droplets at the top end, which are picked up by said air jet;

f. horizontal cylindrical target means mounted above said air jet, whereby said jet and liquid droplets will impinge on said target and said droplets will be broken into micron size droplets;

g. an axial cylindrical chimney inside said housing having a skirt extending below said inlet tube, the top end of said chimney extending almost to the top closure, the annulus between said chimney and said housing closed by a mounting flange, a plurality of openings through the wall of said chimney above said flange.

4,007,239

AROMATIC DIAMINES

Johannes Blahak, Cologne-Buchheim; Erwin Müller, and Helmut Kleimann, both of Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

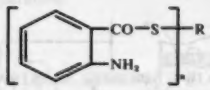
Division of Ser. No. 171,381, Aug. 12, 1971, Pat. No. 3,929,863. This application Oct. 6, 1975, Ser. No. 620,088

Claims priority, application Germany, Aug. 17, 1970, 2040644

Int. Cl.² C07C *153/07*

U.S. Cl. 260—455 R **1 Claim**

1. Aromatic amines of the general formula:



wherein *n* represents an integer of from 2 to 8, and R represents an *n*-valent saturated or unsaturated, straight chain or branched chain hydrocarbon radical which may be interrupted by O or S atoms which is obtained by the removal of OH or SH groups from a polyol or polythiol having a molecular weight of from 76 to 599.

4,007,240

SUPPORTING ARRANGEMENTS FOR POROUS DIFFUSERS

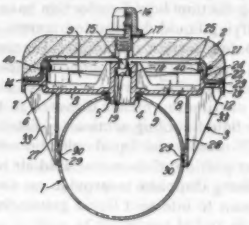
John Gosden, Maidstone, England, assignor to Reed International Limited, London, England

Filed Dec. 1, 1975, Ser. No. 636,787

Claims priority, application United Kingdom, Dec. 6, 1974, 52901/74

Int. Cl.² B01F *3/04*

U.S. Cl. 261—122 **7 Claims**



1. In a gas diffusing system of the type comprising an elongated gas supply pipe having a gas discharge opening in a side wall thereof, a porous diffuser of substantially disc shape, and a unitary supporting element engaging the periphery of said diffuser and located between said diffuser and the exterior of said gas supply pipe adjacent said gas discharge opening for supporting said diffuser on said pipe in outwardly spaced relation thereto, said supporting element cooperating with said diffuser and said pipe to define a substantially enclosed gas chamber exterior of said pipe adjacent said gas discharge opening, the improvement wherein the side walls of said pipe define a pair of spaced recesses each of which is positionally displaced from said gas discharge opening on opposite sides thereof respectively, said unitary supporting element including a pair of spaced, load-bearing limbs positioned to straddle said gas supply pipe and adapted to be resiliently flexed away from one another as said limbs are pushed onto said pipe on opposite sides of said gas discharge opening respectively, and a pair of projections on said limbs respectively extending toward one another and spaced from one another by a distance less than the length of the chord between said spaced recesses in said pipe whereby said projections snap into and

interengage with said recesses respectively when the limbs of said supporting element are pushed onto said pipe thereby to positively locate said supporting element relative to said pipe.

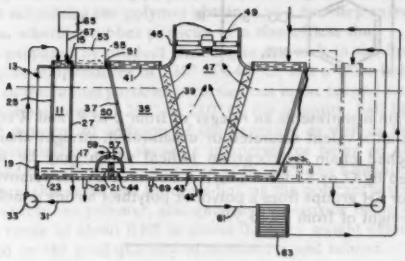
4,007,241
COMBINATION HUMIDIFYING AND COOLING APPARATUS AND METHOD

Peter M. Phelps, 15 Buckeye Way, Kentfield, Calif. 94904

Continuation-in-part of Ser. No. 327,154, Jan. 26, 1973, Pat. No. 3,917,764. This application Oct. 1, 1975, Ser. No. 618,499

Int. Cl.² F28C *1/06*

U.S. Cl. 261—149 **16 Claims**



1. A combination humidifying and cooling apparatus comprising,

a. a humidifying section including fill means, an air inlet opening communicating with the surrounding air, an air outlet opening, liquid distribution means disposed in the upper portion of the section, liquid collection means disposed in the lower portion of the section, and a blow-down liquid outlet for said liquid collection means,

b. recycle means consisting essentially of a conduit and associated pumping means for directing liquid from the humidifying section liquid collection means directly to the humidifying liquid distribution means,

c. a liquid cooling section including fill means, an air inlet opening in generally open communication with the humidifying section air outlet opening, an air outlet opening, liquid distribution means disposed in the upper portion of the liquid cooling section to distribute the liquid onto said fill means, and liquid collection means disposed in the lower portion of the same, said air inlet and outlet openings being disposed to provide an air path through said fill means to intersect liquid gravitating through the same,

d. barrier means for separating said cooling section collection means and humidifying section collection means, and

e. a recycle line to provide communication with said cooling section liquid collection means and cooling section liquid distribution means, and heat exchange means associated with said recycle line for transmitting heat from a heat source to the liquid flowing through the heat exchanger.

4,007,242
PROCESS FOR THE MANUFACTURE OF ORIENTED HOLLOW PLASTIC ARTICLES

Michel Lorgé, Brussels, and Roger Houba, Gembloux, both of Belgium, assignors to Solvay & Cie, Brussels, Belgium

Filed Jan. 24, 1975, Ser. No. 543,932

Claims priority, application France, Feb. 14, 1974, 74.05461

Int. Cl.² B29C *17/07*

U.S. Cl. 264—89 **6 Claims**

1. In a process for manufacturing oriented hollow plastic articles by pre-blowing, in a preform mold, a portion of a cylindrical parison into a preform having a cylindrical shape over one part of its length and a sealed end defining the base of the preform, thermally conditioning the preform to bring it to a temperture at which the plastic will undergo molecular orientation during a subsequent blowing operation, and then placing the conditioned preform in a final blow-mold and effecting such subsequent blowing operation by applying excess pressure internally of the preform to cause it to be shaped by stretching into its final form, the improvement wherein said step of pre-blowing comprises: sealing the end of the parison, in the preform mold, along a straight line to define

the base; and applying excess pressure internally of the sealed parison in the preform mold to produce the preform in a manner such that the base is substantially equal in length to one-half the perimeter of the cylindrical part and to create an intermediate length part which is interposed between the cylindrical part and the base and has a cross section which varies progressively from the cylindrical shape of the cylindrical part to the straight-line shape of the base while maintaining a substantially constant perimeter.

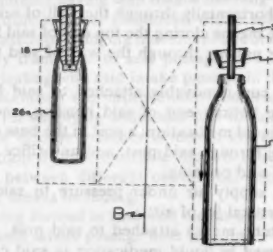
4,007,243
METHOD OF BLOW MOLDING

Samuel J. Rupert, Ann Arbor, Mich., assignor to Hoover Ball and Bearing Company, Saline, Mich.

Continuation of Ser. No. 445,566, Feb. 25, 1974, abandoned. This application Aug. 18, 1975, Ser. No. 605,235

Int. Cl.² B29C *17/07*

U.S. Cl. 264—89 **3 Claims**



1. In a method of blow molding a thermoplastic article from a blow moldable thermoplastic material, the steps of extruding a tubular parison of said material at a preblowing station spaced laterally from a separate final blowing station and simultaneously supporting a previously blown preform on a blow pin at said final blowing station, closing a preform mold on the tubular parison while closing a final blow mold on the previously blown preform, immediately upon closing the molds blowing the tubular parison to the shape of the preform blow mold, blowing the preform to the shape of the final blow mold, retracting the blow pin from the mold at said final blowing station, shifting both molds laterally so that the preform blow mold is at said final blowing station and the final

blow mold is at a discharge station, inserting the blow pin into the mold at said final blowing station and inserting a pin into the blown article in the mold at said discharge station, opening both molds while supporting the blown preform on the blow pin at the final blowing station and while maintaining the pin in the blown article at said discharge station, thereby assuring that the blown article is removed from the final blow mold, returning both molds laterally to their initial open positions, and repeating the steps.

4,007,244

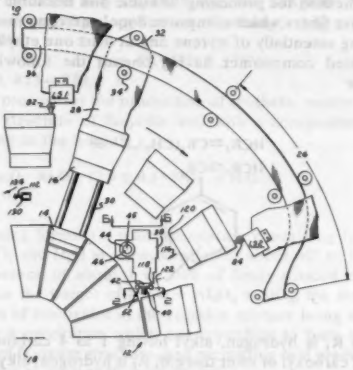
AUTOMATED BLOW MOLDING MACHINE STARTUP

Michael J. Avery, Forrestville; Lawrence A. Martino, East Hartford, and Jon D. Yonko, Vernon, all of Conn., assignors to Monsanto Company, St. Louis, Mo.

Filed Jan. 29, 1975, Ser. No. 544,947

Int. Cl.² B29C *17/07*

U.S. Cl. 264—99 **5 Claims**



1. In the process of loading successive molds of a multistation, rotary blow molding machine which involves:

closing sections of each of said molds on portions of a continuously extruding parison in a confined region of limited dimensional extent adjacent the outlet of an extruder head while said molds continuously traverse an arcuate path of travel;

the improvements in such process occuring during startup of the machine prior to loading the initial mold comprising the steps of:

a. directing the continuous parison out of said region;

b. increasing the speed of the machine to a level such that the rate at which successive molds would be loaded with parison portions approaches the rate at which the parison issues or will issue from the head after startup while maintaining the parison directed out of said region without manual manipulation thereof; and thereafter

c. severing the parison substantially at the outlet of the head by a device actuated outside said arcuate path of travel;

whereby the parison portion exiting the head after severance is immediately clamped between closing sections of the next mold arriving beneath the head.

4,007,245

STRENGTHENING OF FIBER GLASS REINFORCED EPOXY RESIN COMPOSITES BY VACUUM HEAT TREATMENT

Daniel A. Scola, Glastonbury, Conn., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 3, 1975, Ser. No. 583,813

Int. Cl.² B29C *25/00*

U.S. Cl. 264—101 **1 Claim**

1. A method of improving the shear strength properties of a glass fiber/epoxy resin composite article that has undergone degradation from exposure to a polar compound, said method comprising:

i. Placing said glass fiber/epoxy resin composite article in a container that is provided with means for evacuating and means for heating;

ii. evacuating said container to a low pressure of about 1 mm of mercury and heating the container to a temperature of about 300° F.

iii. maintaining said pressure and said temperature for at least one cycle of operation which is about 24 hours; and thereafter,

iv. allowing said composite article to cool to ambient temperature.

4,007,246

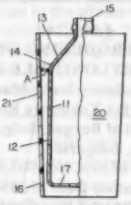
VARIABLE STRENGTH PLASTIC WRAP ON GLASS BOTTLES

Edward L. Bailey, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed June 9, 1975, Ser. No. 585,226

Int. Cl.² B29C *27/00*; **B29D** *3/00*

U.S. Cl. 264—129 **10 Claims**



1. The method of enhancing the fragment retention of a glass container having a neck wall section encircling a head space portion of the container when filled and in upright position comprising the steps of:

a. encircling the exterior surface of the container with a preformed sleeve of a heat shrinkable, polymeric material, the encircled exterior surface including said neck wall section thereof, and

b. heat shrinking said encircling sleeve about the container to provide a polymeric exterior layer of said material of variable thickness, the maximum thickness of said exterior layer overlying the said neck wall section of the container; and

c. the outer surface of the sleeve before shrinking comprising a frusto-conical surface having a major outside diameter and minor outside diameter, said major outside diameter thereof being located opposite the neck wall section of the container, and the shrinking step causing the material adjacent said major outside diameter to form a thicker exterior layer of the material overlying the neck wall section of the container than the remainder of the layer thereon.

4,007,247

PRODUCTION OF FIBRILS

Denis George Harold Ballard; Robert Thomas Murray, and George Michael Fingland Jeffs, all of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Sept. 20, 1973, Ser. No. 399,273

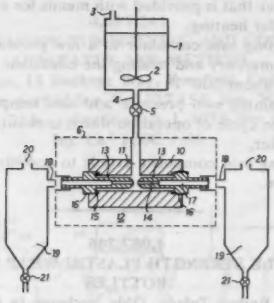
Claims priority, application United Kingdom, Sept. 26, 1972, 43899/72

Int. Cl.² D01D *5/04*

U.S. Cl. 264—140 **15 Claims**

1. A process for producing fibrils of a thermoplastic polymer, said fibrils having a diameter $<25\mu m$ and aspect ratio >20 which comprises subjecting a dispersion of thermoplas-

tic polymer particles in a non-solvent liquid medium in which the polymer is insoluble under the prevailing conditions to a hydrodynamic field having a high longitudinal velocity gradi-



ent thereby forming said fibrils at a temperature such that said particles are sufficiently deformable to be elongated into fibrils by the action of said hydrodynamic field.

4,007,248

METHOD OF PRODUCING DELUSTERED POLYACRYLONITRILE FIBERS

Spas Kostadinov Kostadinov; Iveta Markova Benrey; Vassil Angelov Shopov; Marika Yokimova Kostadinova, and Maria Staneva Dimitrova, all of Burgas, Bulgaria, assignors to DSO "Neftochim", Burgas, Bulgaria

Continuation-in-part of Ser. No. 503,616, Sept. 6, 1974, abandoned. This application Dec. 23, 1974, Ser. No. 536,949

Int. Cl.² D01F *6/18*; C08L *51/04*

U.S. Cl. 264—182 **5 Claims**

1. A method for preparing delustered polyacrylonitrile fibers evidencing a high degree of whiteness and elasticity which comprises wet spinning a fiber forming polymeric solution consisting essentially of

a. a polyacrylonitrile polymer containing at least 80%, by weight, acrylonitrile, and

b. a ter grafted ABS copolymer of acrylonitrile and styrene on a rubber, the polyacrylonitrile being present in an amount ranging from 90–99.8%, by weight, and the ter grafted ABS copolymer in an amount ranging from 0.2–10%, by weight.

4,007,249

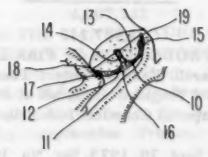
METHOD OF FORMING A REMOVABLE CERVICAL CAP

Robert Allan Erb, Schuylkill Township, Chester County, Pa., assignor to The Franklin Institute Research Laboratories, Philadelphia, Pa.

Filed July 15, 1974, Ser. No. 488,584

Int. Cl.² B29C *1/14*; A61F *5/46*

U.S. Cl. 264—222 **13 Claims**



1. The method of nonsurgically forming a removable cervical cap comprising the steps of

a. expanding the vaginal wall to expose therein the exocervix surface,

b. applying a flowable self-curing elastomeric material to form a layer on said exposed exocervix surface, the cured elastomeric material conforming substantially identically to the exocervix surface without substantial distortion and deformation of the exocervix surface and providing the cervical cap for blocking the entrance to the exocervix.

4,007,250

METHOD FOR PRODUCING INFUSIBLE AND INSOLUBLE STYRENE COPOLYMERIC FIBERS

Isao Kimura, Suita; Koichiro Ohtomo, Takatsuk, and Katsushi Shirane, Settsu, all of Japan, assignors to Kanebo, Ltd., Tokyo, Japan

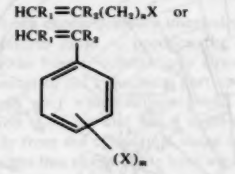
Continuation of Ser. No. 350,931, April 13, 1973, abandoned. This application Oct. 22, 1975, Ser. No. 624,713

Claims priority, application Japan, Apr. 14, 1972, 47-37898

Int. Cl.² B29C *25/00*

U.S. Cl. 264—236 **17 Claims**

1. A method for producing infusible and insoluble styrene copolymer fibers which comprises copolymerizing monomers consisting essentially of styrene and at least one ethylenically unsaturated comonomer having one of the following two formulae



wherein R_1 is hydrogen, alkyl having 1 to 4 carbon atoms, halogen carboxyl or ester thereof, R_2 is hydrogen, alkyl having 1 to 4 carbon atoms or phenyl, X is haloalkyl, amino, carboxyl, carboxylic acid ester, carboxylic acid halide, hydroxyl, amido, nitrile or halogen, n is 0 or 1 and m is 1, 2 or 3, in a molar ratio of stryene to said comonomer of 99/1 to 20/80, to form a styrene copolymer having a molecular weight of 2,000 to 500,000, melt spinning the resulting styrene copolymer into fibers, immersing said fibers in a liquid solution of a cross-linking agent, said solution having an initial temperature of from 20° to 30° C, then raising the temperature of said solution to form 50° to 120° C. in a period of 0.5 to 10 hours and then maintaining the solution at the latter temperature for 1 to 20 hours while maintaining said fibers immersed in said solution to complete the cross linking throughout the entire cross section of the fibers whereby to obtain infusible and insoluble fibers.

4,007,251

METHOD OF MANUFACTURING POWDER BODIES OF BORIDES, CARBIDES OR NITRIDES

Sven-Erik Isaksson; Jan Adlerborn, and Hans Larker, all of Robertsfors, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Continuation-in-part of Ser. No. 396,481, Sept. 12, 1973, abandoned. This application Oct. 25, 1974, Ser. No. 518,150

Claims priority, application Sweden, Sept. 19, 1972, 12053/72

Int. Cl.² C04B *35/60*, *35/58*

U.S. Cl. 264—332 **3 Claims**

1. A method of manufacturing bodies of borides of titanium from a powder possibly having an excess of boron, which comprises enclosing said powder in a container selected from the group consisting of titanium and titanium base alloys, said container forming with boron, compounds which have a melting point at least equal to that of said container, and isostatically hot pressing said container.

4,007,252

STABILIZED SODIUM ALUMINATE SOLUTIONS

James E. Burroughs, Mount Prospect, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Sept. 2, 1975, Ser. No. 609,321
Int. Cl.² C01F 7/02
U.S. Cl. 423—265 2 Claims

1. A chemically stable sodium aluminate solution which comprises, based on the total formulated weight, from about 1 to about 25% sodium aluminate; from about 25 to about 94% water; and from about 5 to about 50% triethanolamine.

4,007,253

PRODUCTION OF SYNTHETIC ZEOLITE OF FAUJASITE STRUCTURE

Lothar Puppe; Günter Ulisch, and Friedrich Schwochow, all of Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed July 25, 1975, Ser. No. 598,980
Claims priority, application Germany, Aug. 7, 1974, 2437914
Int. Cl.² C01B 33/28
U.S. Cl. 423—329 5 Claims

1. A process for the production of synthetic zeolite with the crystal structure of faujasite and with a composition corresponding to the formula

$$Na_2O \cdot Al_2O_3 \cdot (2.5 \pm 0.5)\ SiO_2 \cdot n\ H_2O$$
$$(n = 0 \text{ to } 8)$$

comprising forming a reaction mixture containing Na_2O, Al_2O_3, SiO_2 and H_2O at a temperature of about 60° to 105° C in the presence of about 1 to 20% of finely divided zeolite A based on the weight of $Na_2O + Al_2O_3 + SiO_2$, the molar proportions of the oxides in the reaction mixture being sufficient to form a precipitate which can crystallize to form synthetic zeolite of faujasite structure, and permitting said precipitate to crystallize to essentially pure faujasite.

4,007,254

PROCESS FOR THE MANUFACTURE OF CARBON OXYSULFIDE

Bernard Buathier; Andre Combes; Francois Pierrot, all of Lyon, and Henri Güerpillon, Saint-Cyr-Aumont d'Or, all of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Sept. 9, 1975, Ser. No. 611,705
Claims priority, application France, Sept. 11, 1974, 74.31446
Int. Cl.² C01B 31/26
U.S. Cl. 423—416 11 Claims

1. A process for preparing carbon oxysulfide comprising reacting free sulfur and methanol in the gas phase at a temperature ranging from between about 500° and 800° C.

4,007,255

PREPARATION OF RED AMORPHOUS SELENIUM

David A. Buckley, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 495,242, Aug. 6, 1974, Pat. No. 3,954,951. This application Jan. 16, 1976, Ser. No. 649,959
Int. Cl.² C01B 19/00
U.S. Cl. 423—510 4 Claims

1. A process for producing stable red amorphous selenium containing thallium in particles of less than about 5 microns which comprises:

a. adding a sufficient amount of selenious acid, and from about 10 parts per million to about 10,000 parts per million of thallium dioxide to methanol or ethanol containing not more than about 50 percent by weight water at a temperature between about −20° C. and the freezing point of the solution; and the solution containing hydrazine, the amount of hydrazine being at least stoichiometrically equivalent to the amount of selenious acid in the solution;

b. then maintaining the solution between about −13° C. and −3° C. until the yellow-orange amorphous precipitate formed by the reduction of the selenious acid by the hydrazine changes to red amorphous selenium;

c. then filtering the solution; and

d. then washing the precipitate with methanol or ethanol and drying.

4,007,256

CATALYTIC PRODUCTION OF HYDROGEN PEROXIDE FROM ITS ELEMENTS

Leo Kim, and Galeon W. Schoenthal, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 567,226, April 11, 1975, abandoned. This application Aug. 5, 1976, Ser. No. 712,112
Int. Cl.² C01B 15/02
U.S. Cl. 423—584 21 Claims

1. In the process for the production of hydrogen peroxide by contacting hydrogen and oxygen with a palladium catalyst on a solid support in the presence of water and an acid having a pKa of less than about 5, the improvement which comprises carrying out the process in the presence of a nitrogen-containing hydrocarbyl compound having 2 to 40 inclusive carbon atoms and 1 to 3 inclusive nitrogen atoms per molecule in a concentration of from about 0.1 to about 99.9 percent by volume of the liquid reaction mixture.

4,007,257

ALKALI METAL HYDRIDE FORMATION

Raymond Urgel Lemieux; Emerson Cecil Sanford, both of Edmonton, and John Fraser Prescott, Sherwood Park, all of Canada, assignors to Atomic Energy of Canada Limited, Ottawa, Canada

Filed Mar. 27, 1975, Ser. No. 562,807
Int. Cl.² C01B 6/04, 1/02
U.S. Cl. 423—646 15 Claims

1. A method of producing an alkali metal hydride selected from sodium and potassium hydride which comprises admixing hydrogen at an elevated pressure of 200 to 1,500 psi and a temperature of from −80° C to 50° C with a mixture of at least one lower alkyl mono-amine having 1 to 4 carbon atoms in each alkyl group and an alkali metal alkyl amide of at least one of said amines, the concentration of alkali metal alkyl amide in the amine being at least 0.3 mole percent to cause absorption of hydrogen in said mixture and precipitating alkali metal hydride in said amine mixture and separating the alkali metal hydride so formed from the amine mixture.

4,007,258

SUSTAINED RELEASE PESTICIDAL COMPOSITION

Arthur I. Cohen; James S. Y. Sim; Maurice H. Van Horn; Stanley E. Gordesky, and Stanley I. Gordon, all of Rochester, N.Y., assignors to Union Corporation, Verona, Pa.

Filed Sept. 10, 1973, Ser. No. 395,700
Int. Cl.² A61K 9/26
U.S. Cl. 424—22 6 Claims

1. A sustained release pesticidal composition comprising:

A. a quaternary ammonium bactericide in an amount at least sufficient for the total dosage during a treatment period;

B. a biological binding agent for said pesticide; said biological binding agent being zein and containing bonding sites complementary to bonding sites of said bactericide in an amount effective to bind the bactericide and to provide for the sustained release of said bactericide in the desired dosage amount;

C. a matrix of a water-insoluble but water-swellable hydrophilic polymer, which holds said biological binding agent and which is a copolymer of a monomer mixture of N-

vinyl-2-pyrrolidone, methyl methacrylate, and divinyl benzene wherein the monomer mixture contains based upon the total weight of N-vinyl-2-pyrrolidone, methyl methacrylate, and divinyl benzene, from about 90 to about 45% by weight of the N-vinyl-2-pyrrolidone, from about 5 to about 50% by weight of the methacrylate, and from about 0.5 to about 15% by weight of divinyl benzene;

D. the molecular size or weight of the biological binding agent being sufficient to cause retention of said biological binding agent in said matrix and to prevent egress of said biological binding agent from said matrix during the treatment period.

4,007,259

DENTAL CREAM

Armando Patino, Mexico City, and Bernardo Maldonado, Cd. Satelite Edo, both of Mexico, assignors to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 412,444, Nov. 2, 1973, Pat. No. 3,711,604, which is a continuation of Ser. No. 256,309, May 24, 1972, abandoned. This application Apr. 25, 1975, Ser. No. 571,825 The portion of the term of this patent subsequent to Jan. 16, 1990, has been disclaimed.

Int. Cl.² A61K *7/16*

U.S. Cl. 424—49 **10 Claims**

1. A white opaque clear or translucent aqueous dental cream toothpaste containing at least about 1 up to about 5% by weight chloroform and having dispersed therein 0.2 to 10% by weight of particles of 10 to 300 parts of a water insoluble unpreflavored polymeric thermoplastic low molecular weight polyolefin, per part of dental cream contrasting pigments, or lakes, which otherwise have a tendency to bleed into chloroform containing toothpaste, and that are visible and substantially insoluble in the toothpaste base, being substantially inert to said chloroform, and said particles comprising water and chloroform insoluble pigmented but unflavored plastic subparticles of a desired contrasting color that are visible against the contrasting dental cream background, said chloroform being blended into the dental cream after the particles are first dispersed therein, thereby imparting bleed-resistance of said color in said toothpaste base, said speckles of pigmented plastic particles thereby retaining their distinct and contrasting appearance for at least the normal shelve life of the product and the time it takes to be used by the consumer, without significant attack by the chloroform of the pigment in the pigmented visible particles which would otherwise result in leaching or bleeding of the pigment from the particles into the contrasting color toothpaste base.

4,007,260

DENTIFRICES

Keun Y. Kim, Chesterfield, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 435,052, Jan. 21, 1974, Pat. No. 3,939,262. This application July 18, 1975, Ser. No. 597,852

Int. Cl.² A61K *7/18*

U.S. Cl. 424—52 **4 Claims**

1. An opaque dentifrice composition containing a polishing amount of a finely divided synthetic amorphous silica polishing agent, said polishing agent having an average refractive index from about 1.410 to 1.440 and an average particle diameter of from about 1 to about 30 microns.

4,007,261

PEARLESCENT HAIR CONDITIONER

Ralph P. Sorrentino, Old Bridge, and Burton M. Like, East Brunswick, both of N.J., assignors to Millmaster Onyx Corporation, New York, N.Y.

Filed Aug. 23, 1972, Ser. No. 283,089

Int. Cl.² A61K *7/06*

U.S. Cl. 424—70 **4 Claims**

1. A method of simultaneously obtaining pearlescence and conditioning of hair which comprises applying to the hair an aqueous composition consisting essentially of a conditioning agent and water, said conditioning agent being alkyl dimethylamine oxide wherein the alkyl is substantially straight chain and has 16 to 22 carbon atoms and said conditioning agent being applied in an effective amount sufficient to obtain both pearlescence and conditioning of the hair.

4,007,262

ODOR CONTROL COMPOSITIONS FOR USE IN CHEMICAL TOILET SYSTEMS

Wayne E. Bowers, P.O. Box 615, Stanhope, N.J. 07874

Filed Apr. 5, 1973, Ser. No. 348,150

Int. Cl.² A61L *13/00*

U.S. Cl. 424—76 **9 Claims**

1. An aqueous odor control composition for closed system chemical toilets comprising water, an admixture of zinc sulfate and zinc nitrate, and sufficient ammonium hydroxide to convert all of the zinc to the water soluble stoichiometric ammonia complex and to maintain a pH in the solution of at least about 10.5, adding sodium nitrate as an oxidizing agent, together with sufficient acetic acid to attain an aqueous solution having a pH of between about 7.0 and about 7.5.

4,007,263

STOMA TREATMENT

Virgil F. Pichierri, 53 Brigham Hill Road, Grafton, Mass. 01519

Continuation of Ser. No. 387,332, Aug. 10, 1973, abandoned. This application Mar. 25, 1975, Ser. No. 561,851

Int. Cl.² A61K *31/74*

U.S. Cl. 424—78 **4 Claims**

1. A method of relieving irritation of skin surrounding an iliac stoma; comprising the application to the skin, of a paste comprising an effective of at least 40 percent by weight of calcium, sodium poly(vinyl methyl ether-maleate) in a petroleum jelly base.

4,007,264

METHOD OF TREATING DIARRHEA EMPLOYING A FORMALDEHYDE-MODIFIED CASEIN

Andre Queuille, Noisy-le-Sec, and Raymond Larde, Coubron, both of France, assignors to Roussel-UCLAF, Paris, France

Continuation of Ser. No. 870,356, Sept. 30, 1969, abandoned. This application Jan. 30, 1975, Ser. No. 545,160

Claims priority, application France, Oct. 7, 1968, 68.168987

Int. Cl.² A61K *31/74*

U.S. Cl. 424—82 **2 Claims**

1. A method of treating chronic or infectious diarrhea in humans and warm-blooded animals suffering from symptoms or diarrhea caused by infections, food poisonings, changes in diet, excessive use of laxatives, diseases of extra-intestinal origin, and treatment with antibiotics, which consist essentially of orally administering an effective antidiarrheal amount of from 25 to 125 mg/kg daily of a formaldehyde-modified casein consisting of rennet casein reacted with from 0.6 to 2.5 gm per 100 gm of formaldehyde in the presence of an aqueous medium, and freed of unreacted formaldehyde.

4,007,265
METHOD FOR TREATING TETANUS TOXIN WITH A PROTEINASE TO PRODUCE AN ATOXIC IMMUNOGENIC PRODUCT

Torsten Bertil Helting, Marbach near Marburg an der Lahn, Germany, assignor to Behringwerke Aktiengesellschaft, Marburg an der Lahn, Germany

Filed Oct. 31, 1974, Ser. No. 519,762

Claims priority, application Germany, Nov. 3, 1973, 2355094

Int. Cl.² A61K *39/02*; **C12B** *1/00*

U.S. Cl. 424—92 **13 Claims**

1. The method of making an atoxic immunogenic product, adaptable to injection, which consists essentially of treating tetanus toxin with a peptide-peptido-hydrolase at a pH between 5 and 10 and not to cause the irreversible denaturation of the protein body of tetanus toxin.

10. An atoxic immunogenic product, adaptable to injection, prepared by the method of claim 1.

4,007,266
PHARMACEUTICAL COMPOSITION CONTAINING VITAMIN B_{12}, PROCESS OF MAKING THE SAME AND METHOD OF TREATMENT

Jean Choay, Neuilly-sur-Seine, France, assignor to Choay S.A., Paris, France

Division of Ser. No. 264,752, June 21, 1972, Pat. No. 3,876,765, which is a continuation-in-part of Ser. No. 820,296, April 29, 1969, abandoned, and a continuation-in-part of Ser. No. 820,297, April 29, 1969, abandoned. This application Feb. 26, 1975, Ser. No. 553,434

The portion of the term of this patent subsequent to April 8, 1992, has been disclaimed.

Claims priority, application France, May 3, 1968, 68.150415; May 3, 1968, 68.150416

Int. Cl.² A61K *31/48*, *31/68*, *31/70*, *31/195*

U.S. Cl. 424—105 **11 Claims**

1. A method for the treatment of an animal or human patient suffering from a loss of elasticity or loss of thickness of the skin or from excessive dryness of the skin due to aging of the skin, the said method comprising applying topically to the affected area of the skin an effective amount of a pharmaceutical composition comprising a homogeneous mixture of an aqueous solution of cyanocobalamin or hydroxycyanocobalamin and a pharmaceutically acceptable percutaneous penetration vehicle therefor, the said composition having a pH between about 4.0 and 7.0, being resistant to both oxidation and reduction, and being pharmaceutically acceptable for repeated application to cutaneous connective tissue over prolonged periods of time.

4,007,267
ANTIBIOTIC B-98891

Toyokazu Kishi, Nara; Takashi Iwasa, Kyoto; Taiki Kusaka, and Setsuo Harada, both of Hyogo, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Mar. 28, 1975, Ser. No. 562,935

Claims priority, application Japan, Mar. 28, 1974, 49-35254

Int. Cl.³ H61K *35/74*

U.S. Cl. 424—116 **9 Claims**

1. A member selected from the group consisting of antibiotic B-98891 and the acid addition salts thereof, wherein the antibiotic has the following properties:

a. Melting point: Starts being gradually discolored at about 220° C, and does not show a definite melting point.

b. Elemental analysis: C, 42.73±1.5%; H, 6.01±0.5%; N, 20.48±1.0%; O, 30.05±2.0%,

c. The molecular weight estimated by titration method is 529±100,

d. Specific rotation: $[\alpha]_D^{30} = 91.8°\pm10°$ (c=0.5, H_2O); 68.5°±10° (c=0.5, 1/10N HCl)

e. pKa: 4.2±0.2, 7.0±0.2 (titration)

f. Ultraviolet absorption spectrum:
$\lambda_{max}^{pH\ 7}$ 271±2 nm ($E_{1cm}^{1\%} = 157$)
$\lambda_{max}^{1/10N\ NaOH}$ 271±2 nm ($E_{1cm}^{1\%} = 154$)
$\lambda_{max}^{1/10N\ HCl}$ 280±2 nm ($E_{1cm}^{1\%} = 228$)

g. Significant infrared absorption bands measured in KBr disc method in wave numbers (cm^{-1}): 3330, 3160 (shoulder), 2900, 2850, 1660, 1600, 1505, 1485, 1400, 1375, 1295, 1230, 1180, 1130, 1065, 910, 780, 700, 480,

h. Color reactions:
Greig-Leaback reaction: positive
Sakaguchi reaction: positive
Potassium permanganate reaction: positive
Anilin phthalate reaction: doubtful positive
Ninhydrine reaction: doubtful positive
Pauly reaction: negative
Ehrlich reaction: negative
Dragendorff reaction: negative
Barton reaction: negative
Bentidine periodate: negative
Ferric chloride-sulfosalicylic acid reaction: negative.

4,007,268
PROCESS FOR ALLEVIATING PROLIFERATIVE SKIN DISEASES

John J. Voorhees, Ann Arbor, Mich., assignor to The Regents of the University of Michigan, Ann Arbor, Mich.

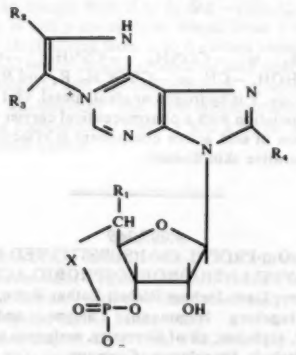
Continuation-in-part of Ser. Nos. 324,012, Jan. 16, 1973, abandoned, and Ser. No. 425,063, Dec. 17, 1963, abandoned. This application May 22, 1975, Ser. No. 580,014

Int. Cl.² A61K *31/675*

U.S. Cl. 424—200 **4 Claims**

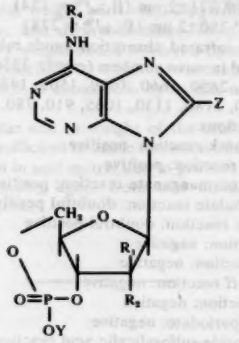
1. A process for treating proliferating skin diseases which comprises administering to the afflicted human or animal, a composition containing as an active component at least one of the compounds selected from the groups:

I. A compound of the formula

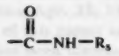


wherein R_1 is H or methyl; R_2 is H or phenyl; R_3 is propyl, isopropyl or phenyl; R_4 is H, bromine, methylthio, or benzylthio; X is oxygen or methylene;

II. A compound of the formula

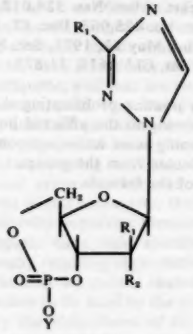


wherein R_1 and R_2 are hydrogen or hydroxyl; Y is hydrogen or alkali metal; Z is hydrogen, benzylthio, thiol, halogen, alkylthio wherein alkyl is from 1 to 8 carbon atoms, inclusive, and hydroxy; R_4 is hydrogen,



wherein R_5 is phenyl, benzyl or alkyl of 1 to 8 carbon atoms;

III. A compound of the formula



wherein R_1 is $-CONH_2$, $-CSNH_2$, $-C(NH)NH_2$, $-C(NH)NHOH$, $-CN$, or $-COOCH_3$; R_1 and R_2 are hydrogen or hydroxy; Y is hydrogen or alkali metal, said compounds being in association with a pharmaceutical carrier wherein the concentration of said active component is effective to alleviate a proliferative skin disease.

4,007,269

O-ETHYL-O-n-PROPYL-O-[-1(SUBSTITUTED-PHENYL)-2-CYANO-VINYL]-THIONOPHOSPHORIC ACID ESTERS

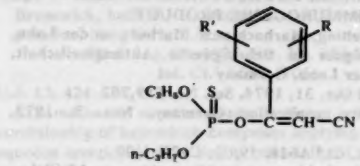
Fritz Maurer; Hans-Jochem Riebel; Lothar Rohe, all of Wuppertal; Ingeborg Hammann, Cologne, and Bernhard Homeyer, Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 28, 1975, Ser. No. 554,345

Int. Cl.² A01N 9/36; C07F 9/165

U.S. Cl. 424—210 **10 Claims**

1. An O-ethyl-O-n-propyl-O-[1-(substituted-phenyl)-2-cyano-vinyl]-thionophosphoric acid ester of the formula



in which

R is hydrogen, C_1–C_4 alkyl, C_1–C_4 alkoxy or halogen, and

R′ is C_1–C_4 alkyl, C_1–C_4 alkoxy or halogen.

4,007,270

COMPLEMENT INHIBITORS

Seymour Bernstein, New City; Norman Bauman, Nanuet, and Milton David Heller, New City, all of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Nov. 18, 1975, Ser. No. 632,931

Int. Cl.² A61K 31/60

U.S. Cl. 424—230 **11 Claims**

1. A method of inhibiting the complement system in a warm-blooded animal in need of such therapy which comprises internally administering to said animal an effective complement inhibiting amount of pharmaceutically acceptable compound selected from the group consisting of aurin tricarboxylic acid, (C_1–C_8) acylates thereof, (C_1–C_8) alkyl esters thereof and salts thereof.

4,007,271

DERMATALOGICAL COMPOUNDS AND COMPOSITIONS

Andrew Robertson, Newcastle-upon-Tyne, England, assignor to Sterling Drug Inc., New York, N.Y.

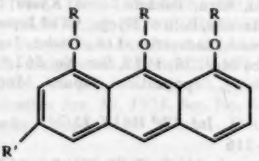
Continuation-in-part of Ser. No. 449,539, March 8, 1974, abandoned, which is a continuation-in-part of Ser. No. 308,261, Nov. 20, 1972, abandoned. This application May 21, 1976, Ser. No. 688,616

Claims priority, application United Kingdom, Nov. 26, 1971, 54927/71

Int. Cl.² C07C 69/78

U.S. Cl. 424—234 **37 Claims**

1. A compound having the formula:



wherein:

each R is a hydrogen atom or an X,Y-substituted-benzoyl group, at least one R being an X,Y-substituted-benzoyl group;

X is a halogen atom, hydroxy, nitro, lower-alkyl, lower-alkoxy, phenoxy, trifluoromethyl, lower-alkylcarboxy or lower-alkoxycarbonyl;

Y is a hydrogen atom or has the meaning given hereinabove for X, and

R′ is a hydrogen atom or a methyl group.

4,007,272
SUBSTITUTED BENZODIAZEPIN-10-ONES IN TREATING PAIN AND DEPRESSION

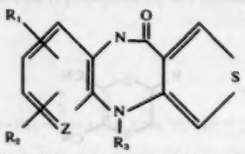
Sidney Robert Safir, River Edge, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 552,023, Feb. 24, 1975, Pat. No. 3,953,430. This application Jan. 29, 1976, Ser. No. 653,404

Int. Cl.² A61K *31/33, 31/445, 31/495, 31/535*

U.S. Cl. 424—248.51 **1 Claim**

1. A method for the treatment of pain and depression in a warm-blooded animal which comprises administering to said animal a pharmaceutical carrier and an analgesic and antidepressant amount of a compound of the formula:



wherein Z is selected from the group CH and N; R_1 and R_2 are the same or different and are selected from the group consisting of hydrogen, lower alkyl, lower alkoxy, halogen, nitro, trifluoromethyl, methylthio, methylsulfonyl and hydroxy; R_3 is selected from the group consisting of hydrogen, lower alkyl and phenylloweralkyl and R is selected from the group comprising hydrogen, diloweralkylaminoloweralkyl, piperidylloweralkyl, morpholinoloweralkyl, pyrrolidinoloweralkyl and piperazinylloweralkyl and acid addition salts thereof, with the proviso that when Z is N, then R_1 and R_2 are hydrogen.

4,007,273
TREATMENT AND PRE-TREATMENT OF DYSMETRIC DYSLEXIA BY IMPROVING SEQUENTIAL SCANNING AND OCULAR FIXATION ABILITIES AND THERAPEUTIC COMPOUNDS

Harold N. Levinson, 15 Lake Road, Great Neck, N.Y. 11020, and Jan Frank, 45 E 82nd St., New York, N.Y. 10028

Continuation-in-part of Ser. No. 424,104, Dec. 12, 1973, abandoned, Division of Ser. No. 528,139, Nov. 29, 1974, Pat. No. 3,940,485. This application Dec. 8, 1975, Ser. No. 638,336

Int. Cl.² A61K *31/52, 31/54, 31/135, 31/445*

U.S. Cl. 424—247 **5 Claims**

1. A method of obviating eye tracking difficulties for a dysmetric dyslexic patient preparatory to said patient participating in reading or scanning activity, which method is based on the discoveries of a cerebellar-vestibular dysfunction and a resulting sub-clinical eye oscillation indicative of said dysfunction, said method comprising the steps of preceding any reading or scanning by such patient with an administered quantity of a cerebellar-vestibular harmonizing drug selected from the group consisting of diphenhydramine, dimenhydrinate, diphenidol and promethazine in a dosage effective to suppress input to and within said patient's cerebellar-vestibular circuits, and only allowing reading or scanning activity by said patient during the effective period of said administered drug, whereby the adverse effect of said sub-clinical eye oscillation as input to said patient's cerebellar-vestibular circuits is obviated by said drug during said reading or scanning activity to thereby enhance said patient's eye tracking ability.

4,007,274
METHOD OF CONTROLLING THE GROWTH OF BACTERIA AND FUNGI USING SUBSTITUTED TETRAHYDRO-S-TRIAZIN-2(1H)-ONE COMPOUNDS

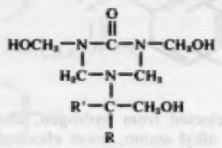
Jerry Hoyt Hunsucker, Terre Haute, Ind., assignor to IMC Chemical Group, Inc., Terre Haute, Ind.

Filed Mar. 22, 1976, Ser. No. 669,356

Int. Cl.² A01N *9/22*

U.S. Cl. 424—249 **9 Claims**

1. A method of controlling the growth of bacteria or fungi by applying to them or to the environment inhabited by them an anti-bacterial or anti-fungal amount of from 50 to 3000 ppm of a compound represented by the formula



wherein R and R′ are hydrogen, methyl, hydroxymethyl or ethyl and can be the same or different.

4,007,275
N-(QUINOLYL)-ANTHRANILATES, THEIR COMPOSITIONS, AND USE

Anne Farthouat, Romainville, and Jean Meier, La Varenne Saint-Hilaire, both of France, assignors to Roussel-UCLAF, Paris, France

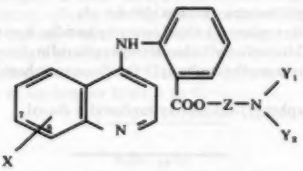
Continuation-in-part of Ser. No. 474,885, May 31, 1974, Pat. No. 3,944,555. This application Dec. 10, 1975, Ser. No. 639,393

Claims priority, application France, June 13, 1973, 73.21434

Int. Cl.² C07D *215/44*

U.S. Cl. 424—258 **6 Claims**

1. Substituted anthranilates selected from the group consisting of N-(7- or 8-substituted-quinolyl-4)-anthranilates of the formula



wherein x is trihalomethylthio in the 7 or 8 position, Z is a member selected from the group consisting of $-(CH_2)_n-$, where n is an integer from 2 to 6, and $-(CH_2)_m-O-(CH_2)_p-$, where m and p are each an integer from 2 to 3, and Y_1 and Y_2 are alkyl having from 1 to 6 carbon atoms, and their non-toxic, pharmaceutically acceptable acid addition salts.

5. An analgesic and anti-inflammatory composition comprising an analgesically and anti-inflammatorily effective amount of a compound of claim 1 and a major amount of a pharmaceutical carrier.

4,007,276
TRIAZOLO ISOINDOLE DERIVATIVES

Amedeo Omodei Sale, Voghera (Pavia); Pietro Consonni, and Leonard J. Lerner, both of Milan, all of Italy, assignors to Gruppo Lepetit, S.p.A., Milan, Italy

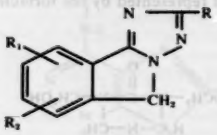
Continuation-in-part of Ser. No. 473,256, May 24, 1974, abandoned. This application May 10, 1976, Ser. No. 684,592

Claims priority, application United Kingdom, May 25, 1973, 25163/73

Int. Cl.² C07D *249/16*

U.S. Cl. 424—263 **18 Claims**

1. A compound of the formula



wherein R is selected from hydrogen, amino, lower alkyl amino, di-lower alkyl amino, lower alkanoylamino, di-lower alkanoylamino, benzoylamino, ureido, thioureido, carbethoxythioureido, benzoylthioureido, sulfhydryl, lower alkyl, trifluoromethyl, phenyl, pyridyl, methylpyridyl, dimethylpyridyl and phenyl having one to three substituents independently selected from lower alkyl, lower alkoxy, lower alkenyloxy, lower alkynyloxy, methylenedioxy, halo, trifluoromethyl, hydroxy, cyclopropyloxy, cyclobutyloxy, cyclopentyloxy, cyclohexyloxy, benzyloxy, carboxymethoxy, carbo(lower alkoxy)-methoxy, amino, lower alkylamino, di-lower alkylamino, lower alkanoylamino and nitro; and R_1 and R_2 each independently represents hydrogen, chloro or lower alkoxy.

4,007,277

PHENYL- AND 1-NAPHTHYL-THIODEOXYNUPHARIDIN-6-α-OLS

Robert Thomas La Londe; Amy Inn-Mei Tsai, both of Syracuse; Chun Juan Wang, Jamesville, and Chunfook Wong, Syracuse, all of N.Y., assignors to Research Corporation, New York, N.Y.

Filed Jan. 31, 1975, Ser. No. 546,143
Int. Cl.² C07D *455/02*
U.S. Cl. 424—267 **8 Claims**

1. A compound selected from the group consisting of:
7β-Phenylthiodeoxynupharidin-6α-ol,
7β-(p-Chlorophenyl)-thiodeoxynupharidin-6α-ol,
7β-(m-Chlorophenyl)-thiodeoxynupharidin-6α-ol,
7β-(p-Carbomethoxyphenyl)-thiodeoxynupharidin-6α-ol, and
7β-(1-Naphthyl)-thiodeoxynupharidin-6α-ol.

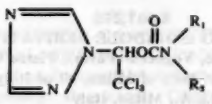
4,007,278

1-(1-CARBAMOYLOXY-2,2,2-TRICHLOROETHYL)-1,2,4-TRIAZOLE DERIVATIVES AS PESTICIDES

Adolf Hubele, Magden, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 7, 1975, Ser. No. 548,052
Claims priority, application Switzerland, Feb. 19, 1974, 2277/74; June 10, 1974, 7883/74; Dec. 20, 1974, 17033/74
Int. Cl.² A01N *9/22;* **C07D** *209/08*
U.S. Cl. 424—269 **18 Claims**

1. A compound of formula I



(I)

wherein
R_1 represents hydrogen, C_1–C_3-alkyl or C_1–C_3-alkoxy, and
R_2 represents C_1–C_6-alkyl or C_3–C_4-alkenyl both optionally substituted by cyano, halogen, nitro, C_1–C_3-alkoxy or C_1–C_3-alkylthio, or C_3–C_6-cycloalkyl or C_3–C_6-cycloalkenyl both optionally substituted by C_1–C_3-alkyl.

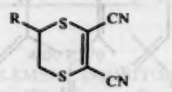
4,007,279

FUNGICIDES

Takaaki Ohtsuka; Keigo Satake; Shiro Yamazaki, and Takeo Watanabe, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 28, 1975, Ser. No. 544,895
Claims priority, application Japan, Jan. 31, 1974, 49-12257; Sept. 11, 1974, 49-103864
Int. Cl.² C07D *339/08*
U.S. Cl. 424—277 **8 Claims**

1. A method for the treatment of fungus diseases in plants comprising applying to fungi a fungicidally effective amount of a composition comprising an inert carrier and an active ingredient having the formula:



wherein R is H, isopropyl, or n-alkyl having 1 to 6 carbon atoms.

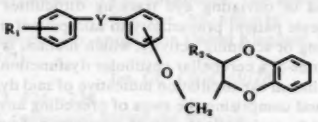
4,007,280

1,4-BENZODIOXAN DERIVATIVES AND PESTICIDAL USE THEREOF

Friedrich Karrer, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed June 16, 1975, Ser. No. 587,446
Claims priority, application Switzerland, June 21, 1974, 8542/74; Feb. 25, 1975, 2375/75; May 29, 1975, 6945/75
Int. Cl.² A01N *9/28;* **C07D** *319/20*
U.S. Cl. 424—278 **15 Claims**

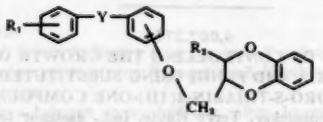
1. A compound of the formula



(I)

wherein R_1 represents hydrogen, alkyl of 1 to 3 carbon atoms or chlorine, R_2 represents hydrogen or alkyl of 1 to 3 carbon atoms, and Y represents —O—, —CH_2—, —S— or >C=O.

13. An insecticidal and acaricidal composition which contains as active component an insecticidally and acaricidally effective amount of a compound of the formula



(I)

wherein R_1 represents hydrogen, alkyl of 1 to 3 carbon atoms or chlorine, R_2 represents hydrogen or alkyl of 1 to 3 carbon atoms, and Y represents —O—, —CH_2—, —S— or >C=O, together with a suitable carrier therefor.

4,007,281
PHARMACEUTICAL COMPOSITIONS CONTAINING QUATERNARY AMMONIUM COMPOUNDS

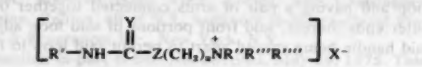
Robert Andrew Bauman, New Brunswick, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 134,827, April 16, 1971, which is a division of Ser. No. 712,968, March 14, 1968, Pat. No. 3,621,048, which is a continuation-in-part of Ser. No. 578,981, Sept. 13, 1966, abandoned. This application Feb. 20, 1976, Ser. No. 659,618

Int. Cl.² A01N 9/20

U.S. Cl. 424—300 8 Claims

1. A pharmaceutical composition comprising an effective amount of a chemical compound effective against gram positive microorganisms represented by the formula



where

R′ is selected from the group consisting of an alkyl group containing 1 to 22 carbon atoms, a phenyl group, a phenyl group substituted by an alkyl group containing 1 to 5 carbon atoms and a phenyl group substituted by an alkoxy group containing 1 to 5 carbon atoms and a phenyl group substituted by halogen; selected from the group consisting of chlorine and bromine

R″ and R‴ are each selected from the group consisting of an alkyl group containing 1 to 2 carbon atoms;

R⁗ is selected from the group consisting of an alkyl group containing 10 to 22 carbon atoms, a phenyl group substituted by halogen selected from the group consisting of chlorine and bromine, a phenyl group substituted by an alkyl group containing 1 to 5 carbon atoms, a phenyl group substituted by an alkoxy group containing 1 to 5 carbon atoms, a divalent phenyl group and a monovalent phenyl group;

Y is selected from the group consisting of oxygen and sulfur;

Z is selected from the group consisting of oxygen and sulfur, at least one of Y and Z being sulfur;

n is an integer 2 to 6; and

X is a compatible anion selected from the group consisting of chloride, bromide, iodide and methosulfate; said compound being admixed with a pharmaceutically acceptable carrier.

4,007,282
LOWERING LIPID AND SUGAR LEVELS IN THE BLOOD WITH A BIS(4-HYDROXYPHENYL)ALKANOIC ACID OR ESTER THEREOF

Otto Mauz, Liederbach, Taunus, and Ernold Granzer, Kelkheim, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

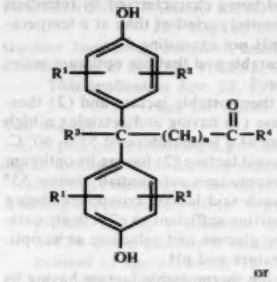
Filed June 7, 1973, Ser. No. 367,887

Claims priority, application Germany, June 10, 1972, 2228448

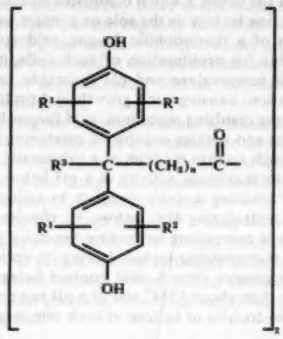
Int. Cl.² A61K 31/19, 31/215

U.S. Cl. 424—308 13 Claims

1. A dry pharmaceutical composition for lowering lipid and sugar levels in the blood of a human or animal suffering from hyperlipemia, said composition being in dosage unit form suitable for oral administration and comprising a physiologically acceptable excipient and 0.1 to 1 g of a metabolically active bis(4-hydroxyphenyl) alkanoic acid or ester thereof corresponding to the formula



or



wherein

R^1 and R^2, which are the same or different, are each hydrogen, halogen, or alkyl having 1 to 4 carbon atoms;

R^3 is hydrogen or alkyl having 1 to 3 carbon atoms;

R^4 is hydroxy, alkoxy having 1 to 8 carbon atoms, phenylalkoxy having 1 to 4 alkyl carbon atoms, or cycloalkyloxy having 5 to 8 carbon atoms;

R^6 is alkylene having 2 to 12 carbon atoms; and

n is zero or an integer from 1 to 6.

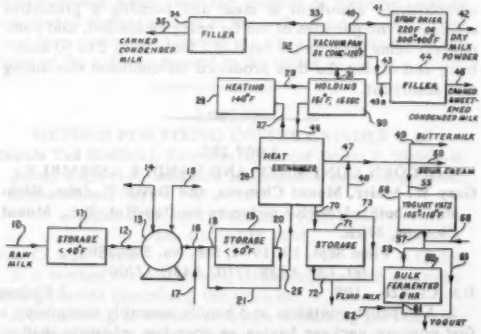
4,007,283
PRODUCTION AND UTILIZATION OF LACTASE

Eli V. Crisan, Davis, and Steven G. Sorensen, Palo Alto, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Oct. 28, 1975, Ser. No. 626,133

Int. Cl.² C12D 13/10; A23C 9/12, 21/00

U.S. Cl. 426—34 21 Claims



1. Lactase derived from thermophilic fungi and in a form suitable for use in catalyzing the hydrolysis of lactose in a

dairy product to glucose and galactose, said lactase having a high enzymatic activity and being characterized by retention of such activity for a substantial period of time at a temperature of 55° – 60° C and a pH not exceeding 5.

8. Lactase that is thermostable and that has optimum activity at a pH not greater than 5.

9. An admixture of (1) thermostable lactase and (2) thermolabile lactase, said lactase (1) having and retaining a high degree of enzymatic activity at a temperature of 55° – 60° C. and a pH between 4 and 5, said lactase (2) having its optimum activity and stability at temperatures substantially below 55° C. and at a pH about 7; each said lactase component being present in substantial proportion sufficient to effectively catalyze hydrolysis of lactose to glucose and galactose at its optimum conditions of temperature and pH.

10. A method of producing thermostable lactase having its optimum activity at a pH below 5 which comprises inoculating a culture medium having lactose as the sole or a major source of carbon with cells of a thermophilic fungus, said culture medium being suitable for proliferation of such cells, maintaining conditions of temperature and pH favorable to cell growth and proliferation, causing such growth and proliferation, and harvesting the resulting mycelium, said fungus being selected from a genus and species capable of producing thermostable lactase in such culture medium at a substantial rate, such lactase having its maximum activity at a pH below 5.

16. A method of treating a dairy product to reduce its lactose content by hydrolyzing the lactose to glucose and galactose; said method comprising subjecting the dairy product to contact with thermostable lactase having its optimum activity at a pH not greater than 5, said contact being at a temperature not less than about 55° C and at a pH not greater than 5 and causing hydrolysis of lactose at such temperature.

4,007,284

PROCESS FOR MANUFACTURING A FATTY CONCENTRATE

Mikhail Ivanovich Goryaev, ulitsa M. Gorkogo, 60, kv. 15; Antonina Demidovna Ulyanova, ulitsa Masanchi, 56, kv. 11; Reingold Georgievich Maier, 11 mikroraion, 28, kv. 92, and Vadim Nikolaevich Startsev, Krasnogvardeisky trakt, 263/16, kv. 2, all of Alma-Ata, U.S.S.R.

Filed June 20, 1975, Ser. No. 588,955

Claims priority, application U.S.S.R., June 28, 1974, 2040319; July 1, 1974, 2039910

Int. Cl.² A23D *5/04, 5/02*

U.S. Cl. 426—98 **9 Claims**

1. A process for manufacturing a fatty concentrate, which comprises heating a fat selected from the group consisting of animal and vegetable fats to a temperature of from 20° to 40° C.; emulsifying said heated fat in the medium of an adsorbent selected from the group consisting of protein and carbohydrate adsorbents, said protein adsorbents selected from whole animal blood, defibrinated animal blood and meat broth, said carbohydrate adsorbent is meal and forming a protective coating on the particles of the fat being emulsified, said components being taken in the ratio of 1 fat to from 2 to 10 adsorbent; and drying the thus produced fat emulsion containing said adsorbent.

4,007,285

POPCORN CONTAINER AND HANDLE ASSEMBLY

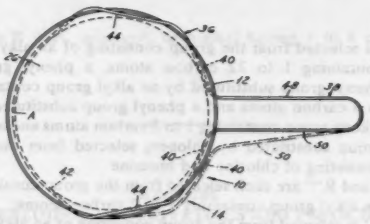
Gary W. Maier, Mount Clemens, and David H. Jehn, Richmond, both of Mich., assignors to Dun-Hot, Inc., Mount Clemens, Mich.

Filed Sept. 19, 1974, Ser. No. 507,350

Int. Cl.² A23F *1/10;* **A45C** *11/00*

U.S. Cl. 426—108 **2 Claims**

1. A popcorn container and handle assembly comprising a first popcorn package having an open-top relatively shallow pan fabricated of semi-rigid self-supporting metallic sheet material, said pan having an annular rim, a cover of flexible sheet material extending across and into the pan and having substantially the same relatively shallow outline as the pan, and a charge of popcorn kernels and cooking oil confined between the pan and cover, said cover being outwardly expandable upon heating of the charge, said rim comprising a first generally radially outwardly extending rim portion and a second overlying reversely bent rim portion, the marginal peripheral edge portion of said cover being clamped between said rim portions, and a detachable utensil made from a single piece of solid metal wire of circular cross-section having the opposite ends thereof secured permanently together to form an endless utensil and comprising a non-circular, non-rectangular, expandable contractable loop for engaging the upper and lower surfaces of the rim of said pan and an elongated expandable and contractable handle of generally U-shape configuration extending from said loop, said loop including front, rear and intermediate portions engageable with said rim, said handle extending from said front portions of said loop and having a pair of arms connected together on the outer ends thereof, said front portions of said loop adjacent said handle being spaced apart to permit said loop to be expanded by applying a force urging the arms of said handle apart and increasing the size of said loop to permit the loop of said utensil to be placed on the rim of said pan, with said handle extending laterally outwardly from said pan, said rear portion of said loop being engaged with only the lower surface and not the upper surface of the rim of said pan, said front portions of said loop being spaced from said rear portion and engaged with only the lower surface and not the upper surface on another portion of said rim, and said intermediate portions of said loop being elongated and located between and connecting, said front and rear portions, each of said intermediate portions including a straight elongated central portion having substantially its entire longitudinal extent engaged with only the upper surface and not the lower surface of other portions of said rim, each of said intermediate portions including integral end portions connecting said central portion to said front and rear portions such that the plane of said central portions is spaced from and parallel to the plane of said front and rear portions and said end portions form an angle with said planes, said loop decreasing in size and firmly gripping said engaged portions of the rim of said pan upon the removal of the force applied to the arms of said handle.



4,007,286

PRODUCTION OF POTATO GRANULES

Buncha Ooraikul, Selangor, Malaysia, assignor to Canadian Patents and Development Ltd., Ontario, Canada

Filed June 3, 1974, Ser. No. 476,053

Int. Cl.² A23B *7/14*

U.S. Cl. 426—262 **23 Claims**

1. A method for the preparation of dehydrated potato granules which comprises subjecting potatoes to the following steps in order:

a. preparing the potatoes for cooking;

b. cooking the potatoes;

c. immediately mashing the cooked potatoes at a temperature of at least 160° F;

d. cooling and freezing the potato mash;

e. thawing the mash;

f. immediately predrying the thawed mash by evaporation to reduce the moisture content to a range of about 35 – 42%; thereby producing potato cells which are separated into single units or cell aggregates

g. thereafter granulating the predryed mash under conditions such that the moisture content remains within said 35-42% range during the entire granulating operation; and

h. drying the potato granules at a temperature and for a period of time sufficient to reduce the moisture content to not more than about 7%.

4,007,287

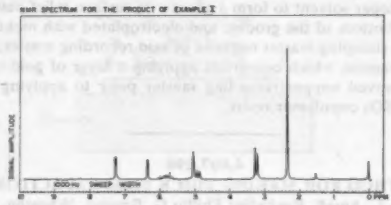
FLAVORING WITH (ALLYL)(2-METHYL-3-FURYL) SULFIDE

William J. Evers, Middletown; Howard H. Heinsohn, Jr., Hazlet; Manfred Hugo Vock, Locust, and Christopher Giacino, Califon, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

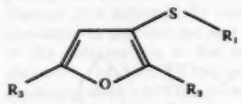
Continuation-in-part of Ser. No. 581,962, May 29, 1975. This application Mar. 12, 1976, Ser. No. 666,347

Int. Cl.² A23L *1/226*

U.S. Cl. 426—535 **2 Claims**



1. A process for augmenting or enhancing the alliacious flavor of a foodstuff comprising adding to said foodstuff from about 0.0001 ppm up to about 250 ppm of a 3-furyl sulfide compound having the structure:



where R_1 allyl, R_2 is methyl.

4,007,288

LOW CALORIE SWEETENING COMPOSITION AND METHOD FOR MAKING SAME

Martin Glicksman, Valley Cottage, N.Y., and Bartley N. Wankier, Battle Creek, Mich., assignors to General Foods Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 55,561, July 16, 1970, Pat. No. 3,761,288. This application Aug. 13, 1973, Ser. No. 387,846

The portion of the term of this patent subsequent to Sept. 25, 1990, has been disclaimed.

Int. Cl.² A23L *1/236*

U.S. Cl. 426—548 **3 Claims**

1. A method for producing a rapidly soluble sweetening composition comprising the steps of forming an aqueous solution of an edible bulking agent and L-aspartyl-L-phenylalanine methyl ester, said bulking agent being selected from the group consisting of organic acids, hydrolyzed starch materials and sugars, said aqueous solution containing less than one part L-aspartyl-L-phenylalanine methyl ester per part of bulking agent, and vacuum drum drying the solution at a drum temperature below 100° C and at subatmospheric pressure.

4,007,289

PROTEIN-RICH BAKING PRODUCT AND METHOD FOR ITS MANUFACTURE

Guenter Jaeckering, Soennern near Werl, Germany

Continuation of Ser. No. 410,252, Oct. 26, 1973, abandoned. This application Apr. 28, 1975, Ser. No. 572,210

Int. Cl.² A21D *13/06*

U.S. Cl. 426—549 **2 Claims**

1. A process for making a protein-rich baked product having an extended shelf-life and which can be cleanly sliced. consisting essentially of the steps of:

adding approximately 60 to 70 parts by weight vital wheat protein having a moisture content of approximately 8–13% and a quantity of cereal starch having a moisture content of approximately 10 to 15% sufficient to make 100 parts by weight to not more than 70 parts by weight of water whereby there is less water than that which the mixture has the capacity to absorb; then

kneading the mixture of vital wheat protein, cereal starch, and water until it reaches a consistency which will register from approximately 600 to 650 units on a Brabender farinograph;

allowing the kneaded mixture to stand for approximately 30 to 90 minutes at a temperature of from 30° to 15° C to develop the inner structure of the dough; subsequently

cutting the dough into pieces as required by the product to be prepared; and thereafter

baking the dough pieces at a temperature which is initially at approximately 210° C and which decreases to 190° C for a period of time sufficient to form a crust;

the steam formed during baking effecting expansion of the baked product, free from requiring chemical leavening agents.

4,007,290

CAFFEINE ANTAGONIM

Benjamin Raphael Zeitlin, Suffern; Alan Bryan Pritchard, Hartsdale, both of N.Y., and Harold S. Levenson, Stamford, Conn., assignors to General Foods Corporation, White Plains, N.Y.

Filed Jan. 9, 1974, Ser. No. 431,797

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.² A23F *1/04, 1/10*

U.S. Cl. 426—594 **14 Claims**

1. A composition for preparing a coffee beverage comprising (a) coffee containing caffeine, said coffee being selected from the group consisting of roasted and ground coffee and soluble coffee solids from roasted coffee, and (b) nicotinic acid or a soluble salt thereof, the amount of nicotinic acid or soluble salt thereof being sufficient to provide from about 6 mg to about 50 mg per cup of coffee beverage prepared from said coffee, wherein a cup of coffee beverage comprises an aqueous solution containing from about 1.5 to 2.0 grams of soluble coffee solids, and the amount of nicotinic acid or soluble salt thereof present in the coffee beverage is effective to at least partially antagonize the sleep disturbing characterictics of the caffeine present in the coffee.

4,007,291

METHOD FOR FIXING COFFEE GRINDER GAS

Dennis Ted Siedlecki, Babylon, N.Y., and James F. Meinhold, Jersey City, N.J., assignors to General Foods Corporation, White Plains, N.Y.

Filed May 20, 1974, Ser. No. 471,631

Int. Cl.² A23F *1/04*

U.S. Cl. 426—594 **6 Claims**

1. A method for aromatizing soluble coffee with an aromatized glyceride comprising the steps of:

a. condensing, as a frost, an aroma-containing gas which has a high carbon dioxide content,

b. placing the aroma-containing frost in a pressure vessel,

c. isolating the vessel from the atmosphere,

d. supplying heat to the contents of the vessel to produce an internal pressure of at least 700 p.s.i.g. and an internal temperature above the congeal point of the glyceride carrier of step e,

e. contacting, within said pressurized vessel, the frost aromas and a liquid glyceride phase, said glyceride being present in the vessel at a level of about 1 gram of glyceride to 0.5 to 6 grams of the frost,

f. thereafter, slowly and isothermally releasing the pressure within the vessel so that the glyceride carrier is maintained in a liquid state, and then,

g. combining the aromatized glyceride with coffee solids.

4,007,292

METHOD OF MAKING A PARFRIED FROZEN POTATO PRODUCT

Mounir A. Shatila, and Samuel J. Huffman, both of Blackfoot, Idaho, assignors to Ampco Foods Inc., San Francisco, Calif.

Filed Dec. 5, 1975, Ser. No. 637,991
Int. Cl.² A23L *1/216*
U.S. Cl. 426—637 **2 Claims**

1. A process for producing an extruded parfried quick-frozen unit suitable for toasting either in frozen or thawed state to produce French fried potatoes, comprising the steps of:

a. providing a quantity of formable potato dough consisting of 23–40% solids and 60–77% water by weight, said solids comprising essentially intact cooked separated potato cells about 1.5% guar gum and about 7% raw starch, all by weight;

b. extruding said dough into a continuous extrudate having a plurality of French fry forms in parallel substantially planar relationship, each form having a central longitudinal void extending throughout, said forms being interconnected by a thin, narrow, easily rupturable film of said dough;

c. crosscutting said extrudate to form a unit having dimensions approximating a standard slice of bread;

d. browning said unit by parfrying for about 90 seconds in fat at a temperature of 330°–360° F. to reduce the moisture content to 35–45% by weight and to impart freeze thaw stability;

e. quick freezing the browned parfried unit; and

f. storing the quick frozen unit at 0° to −10° F. until desired for consumption.

4,007,293

MECHANICALLY VIABLE DEVELOPER MATERIALS

Joseph L. Mincer, Lewisville, Tex., and John M. Pochan, Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 1, 1976, Ser. No. 662,641
Int. Cl.² G03G *13/08*, *13/09*, *9/10*
U.S. Cl. 427—19 **24 Claims**

1. A carrier particle for electrostatographic developer mixtures, said carrier particle having an average particle diameter from between about 30 microns and about 1,000 microns, said carrier particle comprising a core having an outer coating, said outer coating comprising a mixture of poly(2-vinyl-pyridine) and polyurethane.

4,007,294

METHOD OF TREATING A LAYER OF SILICON DIOXIDE

Murray Henderson Woods, and Richard Williams, both of Princeton, N.J., assignors to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 476,837, June 6, 1974, abandoned. This application Mar. 8, 1976, Ser. No. 664,878
Int. Cl.² B05D *3/06*
U.S. Cl. 427—39 **10 Claims**

1. A method of treating a layer of silicon dioxide having a pair of opposite surfaces comprising the steps of:

applying an ionic fluoride compound to one surface of said layer of silicon dioxide, and

directing a corona discharge onto said one surface between a negative electrode spaced from said one surface of said silicon dioxide layer, and the other surface of said silicon dioxide layer which is connected to a source of potential more positive than said negative electrode to drive fluoride ions of said compound into said layer of silicon dioxide.

4,007,295

OLEFIN-SO_2 COPOLYMER FILM ADHESION TO A SUBSTRATE

Eugene Samuel Poliniak, Willingboro; Richard Joseph Himics, Skillman, both of N.J., and Henry Wielicki, Wyndmoor, Pa., assignors to RCA Corporation, New York, N.Y.

Filed July 28, 1975, Ser. No. 599,589
Int. Cl.² H04N *5/82*
U.S. Cl. 427—43 **7 Claims**

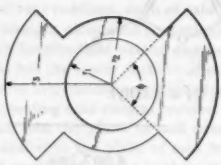
1. In the method of fabricating a video disc record whereby a grooved copper recording master is coated with an olefin-SO_2 copolymer electron beam resist, the electron beam resist is exposed to a video signal-modulated beam of electrons produced by a scanning electron microscope, developed with a developer solvent to form a geometric surface relief pattern in the bottom of the groove, and electroplated with nickel to form a stamping master negative of said recording master, the improvement which comprises applying a layer of gold onto the grooved copper recording master prior to applying the olefin-SO_2 copolymer resist.

4,007,296

METHOD FOR MAKING THICK FILM CAPACITORS

Joseph L. Ansell, Rockville; Phillip G. Brusius, Wheaton, and Raymond J. Baker, Silver Spring, all of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 29, 1974, Ser. No. 484,019
Int. Cl.² H01G *4/06*
U.S. Cl. 427—79 **1 Claim**



1. A method of making a capacitor of a desired capacitance comprising the steps of

selecting an electrode pattern for said capacitor having a center point, wherein said electrode pattern is an annulus having inside and outside radii which annulus is extended in diametrically opposed directions by two diametrically opposed portions of a circle, each of said portions being defined by an inside arc having the same radius as said outside radius of said annulus and an outside arc having a greater radius, and each of said portions subtending an arc of less than 180°, and which when printed on opposite faces of a substrate, with respective center points aligned, and when the patterns are rotated such that the printed electrode pattern on each face is rotated relative to the electrode on the opposite face, the electrodes provide an area of electrode overlap which varies according to a linear function of the relative rotation between the two patterns,

determining the specific amount of said relative rotation which results in the overlap corresponding to said desired capacitance,

conductively printing a first one of said patterns on one face of a substrate,

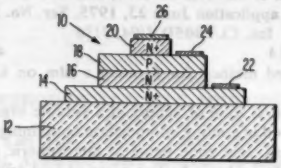
conductively printing a second one of said patterns on the opposite face of said substrate with the center point of said second pattern aligned with the center point of said first pattern, but with said second pattern relatively rotated by said specific amount with respect to said first pattern.

4,007,297

METHOD OF TREATING SEMICONDUCTOR DEVICE TO IMPROVE ITS ELECTRICAL CHARACTERISTICS

Paul Harvey Robinson, Trenton, and Ram Shaul Ronen, Kendall Park, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Sept. 20, 1971, Ser. No. 181,982
Int. Cl.² H01L 21/38
U.S. Cl. 427—93 1 Claim



1. A method of improving the electrical characteristics of a semiconductor device which includes a body of single crystalline silicon comprising:

depositing a layer of silicon oxide directly on a surface of the silicon body from a thermally reacted gas containing silicon and oxygen, and

exposing said semiconductor device with said layer formed thereon to a substantially water vapor free atmosphere consisting of chlorine gas and oxygen, the concentration of the chlorine gas in the atmosphere being between about 0.5 and 5.0% by volume, while heating said semiconductor device to a temperature of between 800° C and 1200° C.

4,007,298

POLYETHYLENE COATING FOR FERROUS METALS

Chester E. Feehan, Allentown, and Ernest F. Wagner, Delanco, both of N.J., assignors to United States Pipe and Foundry Company, Birmingham, Ala.

Division of Ser. No. 464,658, April 26, 1974, abandoned. This application Apr. 21, 1975, Ser. No. 570,086
Int. Cl.² B05D 3/02, 3/08, 3/10
U.S. Cl. 427—195 2 Claims

1. A method of coating a metal article with a polyethylene composition comprising the steps of preparing a blend of high density and low density polyethylene powders, said blend containing a range by volume of from 1 part of high density polyethylene and 1 part of low density polyethylene to 1 part of high density polyethylene to 3 parts of low density polyethylene, heating a surface of said metal article to a temperature of between above 450° to about 600° F. applying said blend of powders over said heated surface of said metal article to a desired thickness, maintaining said surface at a temperature of between over 450° to about 600° F. for a period of from about 5 to 15 minutes, and the cooling said metal article to ambient temperature.

4,007,299

METHOD FOR MAKING MATT FINISH COATINGS

Felix Schülde, Wulfen; Johann Obendorf, Dorsten; Kurt Neubold, Gladbeck, and Gunter Dörmann, Bochum, all of Germany, assignors to Veba-Chemie AG, Gelsenkirchen-Buer, Germany

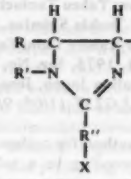
Division of Ser. No. 470,232, May 15, 1974, Pat. No. 3,947,384. This application Aug. 21, 1975, Ser. No. 606,623
Int. Cl.² B05D 3/02, 3/10
U.S. Cl. 427—195 7 Claims

1. Method for making matt finish coatings which comprises

a. applying a powder varnish to a substrate, said powder varnish comprising a finely divided mixture of

i. a 1,2-epoxy compound having at least one 1,2-epoxy group in the molecule and a lower melting point greater than 40° C; and

ii. a salt of a polycarboxylic acid having three or more carboxyl groups; and a cyclic amidine having the formula



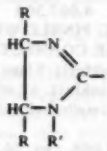
wherein

R is H, alkyl or aryl;

R′ is the same as R and in addition cycloalkyl, or a heterocycloalkyl radical obtained by substituting one or more —N—, —S—, and/or —O— atoms in a cycloalkyl ring;

R″ is alkyl and aryl substituted alkylene or arylene; and

X hydrogen or the radical



wherein

R and R″ are as defined previously; and

b. thereafter reacting said powder varnish at a temperature of 100° to 240° C to form a matt finish coating.

4,007,300

METHOD OF CONDITIONING FABRICS IN A CLOTHES DRYER

Agnes R. McQueary, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 347,606, April 3, 1973, Pat. No. 3,956,556. This application Nov. 10, 1975, Ser. No. 630,371
The portion of the term of this patent subsequent to Mar. 16, 1993, has been disclaimed.
Int. Cl.² B05D 3/12
U.S. Cl. 427—242 3 Claims

1. The method of conditioning fabrics in a laundry dryer which comprises commingling said fabrics in said dryer with a fabric-conditioning article comprising a flexible web substrate carrying a fabric-conditioning agent removable to fabrics by contact therewith, said fabric-conditioning article having perforations sufficient in size and number as to permit at least 75% of the normal volume of air flow through said dryer when said article is used therein.

4,007,301

METHOD FOR PRECOATING A FILTER WITH A MIXTURE OF ANION AND CATION EXCHANGE RESIN PARTICLES

Roberto De Martino, Milan, Italy, assignor to Ecodyne Corporation, Chicago, Ill.

Filed July 29, 1974, Ser. No. 492,465
Int. Cl.² B01D *37/02*; B05D *5/00*
U.S. Cl. 427—244 6 Claims

1. A method for precoating a filter with a mixture of anion and cation exchange resin particles in the size range of about 60 to 400 mesh comprising:mixing said anion and cation exchange resins in aqueous suspension at a temperature of about 100° to 212° F., whereby to cause said resins to agglomerate with one another to form larger particles; and coating said resins onto a filter.

4,007,302

CASE-HARDENING METHOD FOR CARBON STEEL

Hiroshi Hashimoto, Chiba; Takeo Taniuchi, Tokyo; Kiyomitsu Suga, Kawaguchi, and Toshio Shimizu, Tokyo, all of Japan, assignors to Kabushiki Kaisha Daini Seikosha, Japan

Filed Feb. 11, 1975, Ser. No. 548,975
Claims priority, application Japan, June 25, 1974, 49-71896
Int. Cl.² C23F *11/08*, *9/02*
U.S. Cl. 427—249 8 Claims

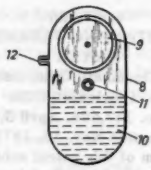
1. A case-hardening method for carbon steel in the metallic cementation thereof according to a solid powder method, comprising the steps of preparing a powder mixture by combining a halogenated salt as catalyst with titanium powder and chromium oxide powder, embedding carbon steel in said powder mixture and subjecting the resultant mixture to a heat treatment to thereby form a carbide hardened layer mainly composed of titanium carbide, wherein the proportion of said chromium oxide in said mixture is sufficient to provide said carbon steel with a uniformly thick layer of titanium carbide having an hardness of approximately at least 3000 Hv.

4,007,303

METHOD OF MAKING PINTLE WIRE FOR HIGH LOAD HINGE CONNECTIONS

Wilhelm Schuster, Frankfurt; Klaus Wollmann, Eschhofen, and Jürgen Stahl, Frankfurt, all of Germany, assignors to Fitztuchverwaltungs-Gesellschaft mit beschrankter Haftung, Frankfurt, Germany

Division of Ser. No. 192,008, Oct. 26, 1971, abandoned. This application Aug. 12, 1974, Ser. No. 496,910
Claims priority, application Germany, Oct. 30, 1970, 2053273
Int. Cl.² B05D *1/18*, *3/00*
U.S. Cl. 427—296 6 Claims



1. A method of producing a pintle wire for hinge connections, especially for textile webs and transmission belts, which includes in combination the steps of: building up a multi-layer skeleton of braided synthetic fibers in the form of a hose, desizing the thus built-up skeleton by means of a solvent, drying the thus desized skeleton of braided synthetic fibers, introducing into a lower portion of a container a permeating solution adapted after removal of its solvent and after hardening to form a heat hardenable synthetic material, introducing the multi-layer skeleton of braided synthetic fibers into the container above the solution, thereupon evacuating said container with the skeleton of fibers above the solution, thereby first removing any gaseous components and air from said skeleton of fibers and also from said solution prior to dipping said skeleton of fibers into the permeating solution, subsequently while in the evacuated container immersing said synthetic fibers into said immersing solution, thereupon by means of a water-free gas above said solution producing an overpressure of from 5 to 10 atmospheres above atmospheric pressure in said container, maintaining said last mentioned pressure for a number of hours, after pressure equalization has occurred in said container withdrawing the impregnated synthetic fibers from said container through a calibrated nozzle and through a heating zone having a temperature of from 50° to 100° C. for hardening the heat hardenable synthetic material, and winding up the thus produced synthetic fibers on reel means.

4,007,304

METHOD FOR COATING SURFACES

James L. Dunn, Jr., Lake Jackson; John K. Ward, Angleton, and Patrick H. Martin, Lake Jackson, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 237,274, March 23, 1972, abandoned. This application June 23, 1975, Ser. No. 589,226
Int. Cl.² B05D *3/04*, *1/36*
U.S. Cl. 427—314 4 Claims

1. An improved method for forming a film on a surface comprising

establishing a first zone of vapors of a volatile organic solvent employed in coating composition containing the film forming agent, said zone being at atmospheric pressure and at the atmospheric boiling point of said organic solvent.

establishing a second zone of vapors of said volatile organic solvent in interfacial relationship with said first zone but substantially free of direct contact with the ambient atmosphere, said second zone being maintained at a temperature above the atmospheric boiling point of said organic solvent by supplying heat to said zone external of said heat of vapors arising from the coating composition or the first zone;

introducing the surface to be coated into said first zone;

applying the coating composition to said surface upon the surface reaching equilibrium with said zone;

introducing said coated surface into said second zone and maintaining said coated surface and said second zone in such condition that solvent will evaporate from the applied film at a controlled rate such that the film is gelled to prevent its sagging, held in this gelled state in said second zone for a time sufficient for surface imperfections to level out, and finally dried to a tack free and essentially solvent free condition, the surface being then at a temperature above the atmospheric boiling point of said organic solvent;

and removing said surface from said second zone through said first zone or a third zone of the same nature as said first zone into the ambient atmosphere.

4,007,305

METHOD OF IMPARTING NONDURABLE SOIL RELEASE AND SOIL REPELLENCY PROPERTIES TO TEXTILE MATERIALS

Sarwan K. Kakar, Southgate; Frank R. Kappler, Wyandotte; Gilbert S. Gomes, Southgate, and John J. Cramer, Wyandotte, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Dec. 23, 1974, Ser. No. 535,264
Int. Cl.² B05D *3/00*
U.S. Cl. 427—322 15 Claims

1. A method of imparting nondurable soil release and soil repellency properties to textile material including textile fibers

comprising the steps of intimately contacting the fibers of the said textile material with an alkaline aqueous medium containing as the essential ingredients for imparting the said nondurable soil release and repellency properties (a) a dissolved water soluble hydrophilic soil release polymer containing carboxylic acid groups whereby a soil release finish comprising the said soil release polymer is deposited on the surfaces of the fibers, (b) a dispersed hydrophobic soil repellent fluorochemical finish whereby a soil repellent finish comprising the said fluorochemical is deposited on the surfaces of the fibers, and (c) water soluble polyvinylpyrrolidone, the said aqueous medium having a pH value of about 7.5–11 and containing about 0.25–4% by weight of the soil release polymer, about 0.05–1% by weight of the soil repellent fluorochemical, and about 0.05–1% by weight of the water soluble polyvinylpyrrolidone, and drying the textile material having the said soil release polymer and the said soil repellent fluorochemical deposited on the fibers thereof to produce a dry textile material having nondurable soil release and soil repellency properties.

4,007,306

METHOD OF APPLYING AQUEOUS COATING COMPOSITIONS

George Lim Poy, Orchard Lakes, Mich., and Edward A. Sproul, Anaheim, Calif., assignors to Inmont Corporation, New York, N.Y.

Filed Nov. 26, 1974, Ser. No. 527,393
Int. Cl.² B05D *3/02, 1/02*
U.S. Cl. 427—377 **16 Claims**

1. A method of applying coatings to automobiles comprising:

a. spraying the automobile in a relative humidity throughout the coating process of 40 to 60% with an aqueous thermosetting coating composition having a threshold cross-linking temperature above 300° F. and comprised of:

A. 0 to 20% pigment,

B. 3 to 16% water compatible aminoplast cross-linking agent,

C. 4 to 25% volatile water miscible organic solvent which forms an azeotrope with water which boils at 70°– 99° C.,

D. 10 to 32% of a water soluble acrylic copolymer having a Tg of 20° C. to 80° C., a molecular weight of 2,000 to 100,000, said copolymer being the copolymerization product of (a) 60 to 86.5% by weight of at least one monomer of the group consisting of 1–4 carbon alkyl acrylates, 1–4carbon alkyl methacrylates, styrene, vinyl toluene, and diacetone acrylamide; (b) 5.0 to 34% by weight of a reactive monomer of the group consisting of hydroxyethyl, hydroxypropyl and glycidyl esters of acrylic and methacrylic acids; (c) 0.5 to 6% by weight of an α, B-ethylenically unsaturated nitrile, and (d) 5 to 18% by weight of an α, B-unsaturated carboxylic acid of the group consisting of acrylic acid, methacrylic acid, maleic anhydride and fumaric acid,

E. an acrylic copolymer solubilizing reagent of the group consisting of ammonia and volatile amines, in an amount sufficient to solubilize the acrylic copolymer at a pH of 7 to 12 and

F. water,

b. heating the wet coated surface at a temperature below the threshold cross-linking temperature of the coating to remove substantially all of the volatile components before appreciable cross-linking begins and

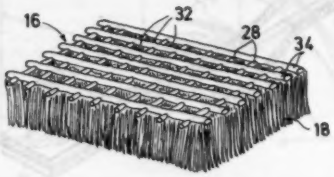
c. then heating the coating above 300° F. until the coating is cured.

4,007,307

ARTIFICIAL LAWN

Hans-Joachim Friedrich, Backnang, Germany, assignor to J. F. Adolff AG, Backnang, Germany

Continuation of Ser. No. 189,635, Oct. 15, 1971, abandoned. This application June 25, 1974, Ser. No. 483,062
Claims priority, application Germany, Oct. 17, 1970, 5110842
Int. Cl.² A01N *3/00*; A41G *1/00*
U.S. Cl. 428—17 **22 Claims**



1. An artificial lawn adapted to be laid on the ground comprising a textile base carrier and a pile affixed thereto forming a turf surface, the yarns of said carrier and said pile being intermeshed with each other to provide structures projecting from the plane of the back side of said carrier and interstices therebetween, the intermeshed yarns of said carrier and said pile being securely adhered together by a coating applied substantially only to said projecting structures, whereby transverse openings through said carrier and horizontal drainage channels are provided along the back side of said carrier.

4,007,308

PROCESS FOR THE PRODUCTION OF PILE SURFACED ARTICLES FROM POLYESTERS

Malcolm Hemming, Delamere, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Mar. 13, 1975, Ser. No. 557,903
Claims priority, application United Kingdom, Mar. 19, 1974, 12077/74
Int. Cl.² B29C *17/02*
U.S. Cl. 428—92 **15 Claims**

1. A process for the production of pile surfaced sheets from crystal forming polymers with glass/rubber transition temperatures above ambient temperatures comprising feeding the polymer in its amorphous state into contact with a heated surface, rapidly raising the temperature of the polymer to a temperature which is below the crystalline melting point but at which it may be drawn into fibres and at which it adheres to the surface and separating the polymer sheet from the surface so that fibrils of the polymer are drawn out due to its adhesion to the surface, cooling the fibrils as they are formed and crystallising the polymer.

13. Pile surfaced material comprising a polyester sheet having fibrils extending from one side thereof said fibrils being integral with the remainder of the sheet the polymer in said fibrils being crystalline and oriented substantially along the major length of the fibrils.

4,007,309

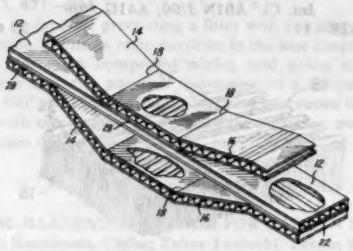
SAG RESISTANT HONEYCOMB LOAD SPACER

James Sewell, Ypsilanti, Mich., assignor to Narad, Inc., Wayne, Mich.

Filed July 12, 1973, Ser. No. 378,643
Int. Cl.² B32B *3/12, 3/28*
U.S. Cl. 428—116 **1 Claim**

1. A structure expandable to form a honeycomb structure comprising a stack of elongated generally flat strips of sheet material, the strips of said stack being secured to adjacent strips at spaced and staggered positions whereby said stack may be expanded to define a honeycomb slab having a multiplicity of cells; a majority of said strips being readily foldable

along lines transverse thereto, at least adjacent those regions where they are secured to adjacent strips; the strips other than said majority of said stack being stiffer, in a direction lengthwise thereof, than said majority of stirps and resistant to folding along said transverse lines, said other strips being relatively few in number and being separated in said stack by a plurality



of said majority of strips whereby said other strips prevent undue vertical elongation of said cells when said slab is suspended from its upper edge portion, said majority of strips comprising corrugated paperboard arranged with the corrugations thereof extending transversely of said strips; said other strips being of corrugated paperboard arranged with the corrugations thereof extending lengthwise of said strips.

4,007,310

METHOD OF DESENSITIZATION USING DESENSITIZING COMPOSITION

Akio Miyamoto; Hiroharu Matsukawa, both of Fujimiya, and Nobuo Yamamoto, Minami-ashigara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Mar. 21, 1975, Ser. No. 560,680

Claims priority, application Japan, Mar. 22, 1974, 49-32337

Int. Cl.² B41M *5/12*

U.S. Cl. 428—195 **9 Claims**

1. A method for desensitizing a color developer capable of forming a color upon contact with a color former comprising contacting the color developer with a desensitizing composition which includes as a desensitizing agent the reaction product of (a) an alkylsiloxane, an alkylsilmethylene or an alkylsilane, and (b) an alkylene oxide or an alkylene imine, wherein the alkylene imine may be tertiary amine, said desensitizing agent having a Si—O—Si bond, a Si—C—Si bond or a Si—Si bond in the molecule and containing an alkyleneoxy group or an alkylemeimino group in the molecule, and wherein said desensitizing agent is employed in amounts of about 1 to 60% by weight of said desensitizing composition.

4,007,311

POLYACRYLATE-GRAFTED BLOCK COPOLYMER ADHESIVE COMPOSITIONS

James T. Harlan, Jr., Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Nov. 6, 1975, Ser. No. 629,455

Int. Cl.² C08L *27/00, 75/00*

U.S. Cl. 428—246 **8 Claims**

1. An adhesive composition comprising:

a. 5 to 50% by weight of a graft copolymer of a block copolymer and a polymerized alkyl ester of an acid of the acrylic acid series wherein said block copolymer is selected from the group consisting of monoalkenyl arene-conjugated diene block copolymers and selectively hydrogenated monoalkenylarene-conjugated diene block copolymers; and

b. 95% to 50% by weight of a polyurethane cement.

4,007,312

METHOD OF BONDING SOLID LIGNOCELLULOSIC MATERIAL, AND RESULTING PRODUCT

Jan Stofko, Albany, and Eugene Zavarin, San Francisco, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Sept. 27, 1973, Ser. No. 401,370

Int. Cl.² C09J *1/00, 5/00*

U.S. Cl. 428—420 **16 Claims**

16. Plywood laminate obtained by the method of claim 6.

4,007,313

MAGNETIC RECORDING MEDIUM

Shigetaka Higuchi; Yoshiaki Hisagen, both of Sendai; Minoru Takamizawa, and Masatoshi Takita, both of Annaka, all of Japan, assignors to Sony Corporation, Tokyo, Japan and Shin-Etsu Chemical Co., Inc., both of Tokyo, Japan

Filed Oct. 1, 1975, Ser. No. 618,368

Claims priority, application Japan, Oct. 2, 1974, 49-114391

Int. Cl.² H01F *1/37;* B32B *9/04*

U.S. Cl. 428—447 **8 Claims**

1. In a magnetic recording medium having a non-magnetic base and a magnetic layer formed thereon containing magnetizable particles dispersed in a resinous binder, the improvement comprising said magnetic layer having an organosilicon compound represented by the formula

$$(RCOO)_nSi(CH_3)_{3-n}$$
$$|$$
$$CH_2CH_2CF_3$$

where R is an aliphatic group having from 7 to 17 carbon atoms and n is an integer from 1 to 3, said organosilicon compound being present in an amount sufficient to provide lubricating properties to said magnetic layer.

4,007,314

MAGNETIC RECORDING MEDIUM WITH SILANE LUBRICANT

Shigetaka Higuchi; Yoshiaki Hisagen, both of Sendai; Minoru Takamizawa, and Masatoshi Takita, both of Annaka, all of Japan, assignors to Sony Corporation and Shinetsu Chemical Co., Ltd., both of Tokyo, Japan

Filed Oct. 1, 1975, Ser. No. 618,367

Claims priority, application Japan, Oct. 2, 1974, 49-114390

Int. Cl.² B32B *9/04*

U.S. Cl. 428—447 **7 Claims**

1. In a magnetic recording medium having a non-magnetic base and a magnetic layer formed thereon containing magnetizable particles dispersed in a resinous binder, the improvement comprising said magnetic layer having an organosilicon compound represented by the formula

$$(RCOO)_nSi(CH_3)_{4-n}$$

where R is an aliphatic group containing from 7 to 17 carbon atoms and *n* is an integer from 1 to 3, said compound being present in an amount of from 0.3 to 5 parts by weight for every 100 parts by weight of said magnetizable particles.

4,007,315

BATTERY CELL COOLING SYSTEM

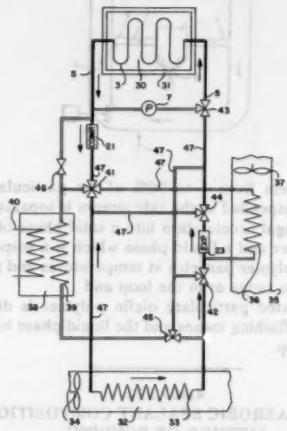
Jürgen Brinkmann, Hagen, and Hermann Franke, Ennepetal, both of Germany, assignors to Varta Batterie Aktiengesellschaft, Hannover, Germany

Filed Mar. 12, 1975, Ser. No. 557,831

Claims priority, application Germany, Mar. 27, 1974, 2414758

Int. Cl.² H01M *10/50*

U.S. Cl. 429—62 17 Claims



1. A system for dissipating the heat developed in the cells of a multicell storage battery, comprising:

cooling elements immersed in the electrolyte in the tops of said battery cells;

said cooling elements being formed of material having high heat conductivity and electric resistance, and said medium having low electric resistance, whereby said cooling medium is caused to circulate through said elements is substantially potential-free manner, and

said cooling elements being connected between manifolds in groupings:

means for causing a cooling medium to circulate through said cooling elements, said circulation of cooling medium being produced by a pump causing passage of said medium via said manifolds through said elements;

heat exchanger means connected between said manifolds and equipped with a blower for forced air cooling;

a bypass conduit for said heat exchanger also connected between said manifolds;

a two-way valve for causing said medium to flow alternatively through said heat exchanger means and said bypass conduit;

heat sensing means located in individual cells for separately controlling saidpump, said two-way valve and said forced air cooling blower; and

compressor means connected to one side, and expansion means connected to the other side of said heat exchanger means, said pump being positioned in said bypass conduit.

4,007,316

DEFERRED ACTION BATTERY HAVING AN IMPROVED DEPOLARIZER

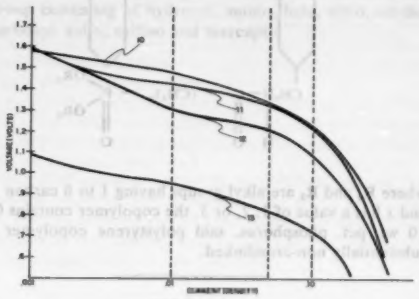
Ralph F. Koontz, Fort Wayne, Ind., assignor to The Magnavox Company, Fort Wayne, Ind.

Filed Nov. 19, 1975, Ser. No. 633,536

Int. Cl.² H01M *6/00*

U.S. Cl. 429—118 14 Claims

6. A deferred action battery having an anode selected from the group consisting essentially of magnesium, aluminum, and zinc with a cathode depolarizer comprising a conductive material, a binder and heavy metal derivatives of aliphatic



monocarboxylic acids wherein the heavy metal derivative includes copper formate.

4,007,317

PHOTOSENSITIVE POLYMERIC MATERIAL AND ELECTROPHOTOMETRIC MATERIAL AND METHODS OF MANUFACTURING SAME

Ekaterina Egorovna Sirotkina, prospekt Lenina, 87, kv. 8; Vadim Petrovich Lopatinsky, prospekt Lenina, 43, kv. 10a; Viktor Dmitrievich Filimonov, ulitsa Usova, 25b, kv. 9; Rita Moiseevna Kogan, ulitsa Vershinina, 37 kv. 205; Vyacheslav Dmitrievich Pirogov, Studgorodok, 2, kv. 8; Sofya Ivanovna Kudinova, Komsomolsky prospekt, 39/2, kv. 6; Ljubov Sergeevna Sizova, ulitsa Osipenko, 31, kv. 215; Svetlana Stepanovna Reznikova, ulitsa Usova, 11a, kv. 109; Georgy Nikolaevich Ivanov, prospekt Kirova, 1, kv. 3a; Nina Alexandrovna Tsekhanovskaya, poselok Sputnik 8, kv. 316, all of Tomsk; Jonas-Donatos Bronyaus Sidaravichus, ulitsa R. Charno, 1, kv. 48, Vilnjus; Larisa Vasilievna Randina, prospekt Lenina 30, Tomsk; Svetlana Lepnidovna Bocharova, prospekt Lenina 30, Tomsk; Galina Petrovna Gulyaeva, prospekt Lenina 30, Tomsk; Raisa Ivanovna Bondarenko, prospekt Lenina, 30, Tomsk; Galina Ivanovna Rybalko, ulitsa Zhirmanu, 20 kv. 82, and Yanina Antono Adomanite, ulitsa Antokalne, 96 kv. 75, both of Vilnjus, all of U.S.S.R.

Division of Ser. No. 307,224, Nov. 16, 1972. This application Aug. 6, 1975, Ser. No. 602,521

Int. Cl.³ C08F *126/06*

U.S. Cl. 526—11.1 2 Claims

1. A film-forming polymer comprising a poly-N-vinyl heterocyclic secondary amine selected from the group consisting of poly-N-vinyl-2-acetyl carbazole, poly-N-vinyl-3-acetyl carbazole, and poly-N-vinyl-3,6-diacetyl-carbazole.

4,007,318

PHOSPHORYLATED POLYSTYRENE AND METHOD FOR FORMING SAME

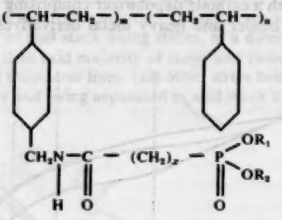
Louis A. Mango, III, Louisville, Ky., and Jimmy L. Webb, Saratoga, N.Y., assignors to General Electric Company, Louisville, Ky.

Filed May 21, 1975, Ser. No. 579,435

Int. Cl.² C07F *9/40*

U.S. Cl. 526—21 12 Claims

1. A copolymer of styrene and phosphorylated styrene, said copolymer being represented by the formula



where R_1 and R_2 are alkyl groups having 1 to 6 carbon atoms and x has a value of 1, 2, or 3, the copolymer contains 0.1 to 10 wt. pct. phosphorus, said polystyrene copolymer being substantially non-crosslinked.

4,007,319

MONITORING SUSPENSION STABILITY

Eugene P. Weisser, Verona; G. Alan Osan, Cheswick, and Edward P. Mailki, Lower Burrell, all of Pa., assignors to ARCO Polymers, Inc., Philadelphia, Pa.

Filed Nov. 10, 1975, Ser. No. 630,484

Int. Cl.² C08F 2/18

U.S. Cl. 526—60 **3 Claims**

1. In a method of making polymer particles by polymerizing monomer in an aqueous suspension, stabilized by suitable suspension stabilizers, in a closed polymerization reactor, the improvement comprising continuously monitoring the electrical conductivity of the suspension during the polymerization until a sudden drop in conductivity is measured, at which point additional suspension stabilizers are added to prevent failure of suspension.

4,007,320

PROCESS FOR REDUCING POLYMER BUILD-UP

Jorgen Petersen, Sundsvall, Sweden, assignor to Kemanord Aktiebolag, Stockholm, Sweden

Filed Apr. 29, 1975, Ser. No. 572,807

Claims priority, application Sweden, May 21, 1974, 7406731; Dec. 16, 1974, 7415794

Int. Cl.² C08F 2/16

U.S. Cl. 526—62 **9 Claims**

1. A process for reducing the build-up of polymer on the internal surfaces of a reaction vessel for polymerization of ethylenically unsaturated polymerizable compounds in aqueous dispersion which comprises the steps of

a. coating major parts of said surfaces with a polymeric material containing hydroxy groups, and

b. insolubilizing said polymeric material by cross-linking with an organic titanate.

4,007,321

MANUFACTURE OF PARTICULATE OLEFIN POLYMERS

Norbert Scholz, Mannheim; Georg Friedrich Vock, Ludwigshafen; Kurt Erdmann, Lambsheim; Guenther John, Ludwigshafen; Hans Frielingsdorf, Bad Duerkheim; Wolfgang Gruber, Frankenthal, and Heinz Mueller-Tamm, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Feb. 20, 1975, Ser. No. 551,494

Claims priority, application Germany, Mar. 1, 1974, 2409839

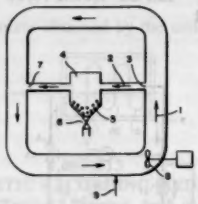
Int. Cl.² C08F 2/14, 6/24

U.S. Cl. 526—64 **4 Claims**

1. A process for the manufacture of particulate olefin polymers consisting of the catalytic polymerization of C_3- to C_8-α-monoolefins at temperatures of from 20° to 110° C and olefin pressures of from 0.01 to 40 bars in an auxiliary liquid containing the monomers to be polymerized in dissolved form and the particulate polymer formed in suspended form, the reaction mixture being circulated in a loop to which the starting materials are fed and from which the particulate polymer formed is removed, wherein

a. a side stream is branched off from said loop to remove from 0.01 to 30% of the material present in the loop at the branching point,

b. the side stream is caused to pass through a separating



zone wherein from 1 to 90% of the particulate olefin polymer suspended in the side stream is separated solely by centrifugal acceleration into a solid phase of particulate polymer and a liquid phase which is a suspension of residual polymer particles at temperatures and pressures in the same range as in the loop and

c. the separated particulate olefin polymer is discharged through a flashing means and the liquid phase is returned to said loop.

4,007,322

ACRYLIC ANAEROBIC SEALANT COMPOSITIONS AND METHOD OF BONDING

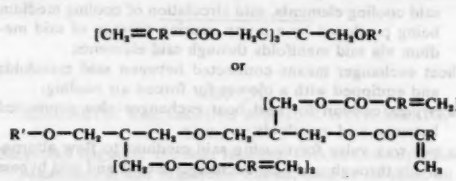
Jack L. House, Memphis, Tenn., assignor to Accrabond Corporation, Cordova, Tenn.

Filed Oct. 7, 1974, Ser. No. 512,955

Int. Cl.² C08F 20/20

U.S. Cl. 526—292 **12 Claims**

1. In an anaerobic sealant composition having extended shelf life in the presence of oxygen and capable of rapid polymerization when oxygen is excluded therefrom including a monomer, a polymerization catalyst for the monomer, selected from the group consisting of peroxy and peroxy-ester compounds, and a polymerization inhibitor for the monomer, the improvement comprising a monomer having the general formula



wherein R is hydrogen, halogen, or alkyl containing 1 to 5 carbon atoms and wherein R′ is hydrogen, halogen, alkyl containing 1 to 5 carbon atoms, or —CO—CR=CH_2.

4,007,323

INITIATOR FOR ANAEROBIC COMPOSITIONS

Bernard Miles Malofsky, Bloomfield, Conn., assignor to Loctite Corporation, Newington, Conn.

Filed Oct. 28, 1975, Ser. No. 626,145

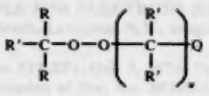
Int. Cl.² C08F 120/20

U.S. Cl. 526—312 **20 Claims**

1. An adhesive or sealant composition having anaerobic curing properties, comprising:

a. an anaerobically curable monomer containing polymerizable acrylate functionality; and

b. about 0.01 to about 10% by weight of the composition of a peroxide of the formula



wherein

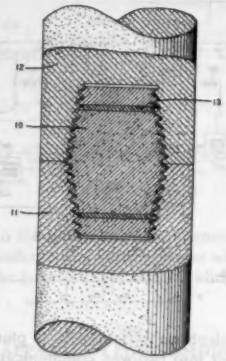
R is selected from the group consisting of C_1 to about C_{10} alkyl, alkenyl, cycloalkyl, and cycloalkenyl and C_6 to about C_{18} aryl, aralkyl and alkaryl; R′ is hydrogen or R; y is 2 or 3; and Q is a polar moiety selected from the group consisting of hydroxyl, amino, halo, nitro, nitrile, carboxyl, sulfo, sulfino and mercapto.

4,007,324

NIPPLE FOR ELECTRODE JOINT

Rudolph W. Wallouch, Lewiston, N.Y., assignor to Airco, Inc., Montvale, N.J.

Division of Ser. No. 511,851, Oct. 3, 1974, Pat. No. 3,976,496, which is a continuation of Ser. No. 302,435, Oct. 31, 1972, abandoned. This application Dec. 15, 1975, Ser. No. 640,354
Int. Cl.² H05B 7/14
U.S. Cl. 13—18 3 Claims



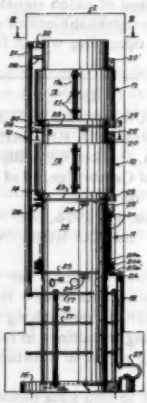
1. In a carbon electrode nipple of the type including a formed void and a locking pitch composition deposited in said void for displacement to the thread clearance spaces of an electrode joint during use of said nipple in joining abutting carbon electrode sections, the improvement wherein said locking pitch composition is a heat-foamable, thermoplastic composition, consisting essentially of a major proportion of finely divided particles of a coal tar pitch having a softening point between 90° C and 180° C dispersed in a minor proportion of a binder comprising lignin sulfonate and water.

4,007,325

FURNACE ASSEMBLY

Arnold G. Bowles; Andrew S. D. Crum, both of Warren, and Melvin E. Speicher, Tidioute, all of Pa., assignors to National Forge Company, Irvine, Pa.

Filed Aug. 13, 1975, Ser. No. 604,169
Int. Cl.² H05B 3/66
U.S. Cl. 13—22 25 Claims



1. An electrically heated furnace assembly, which comprises:

an inner shell, disposed about the longitudinal axis of the furnace assembly;

a plurality of windings of a resistance heating element, helically wound about the longitudinal axis of the furnace assembly and about the inner shell;

a plurality of rigid insulating sleeves enclosing the heating element and substantially covering the surface of the heating element; the plurality of insulating sleeves abutting against the leading and trailing edges of one another, against the outer, upper and lower surfaces of one another, and against the inner shell;

an outer shell; disposed about the longitudinal axis of the furnace assembly and about the inner shell and adapted to hold the insulating sleeves on the heating element against the inner shell; and

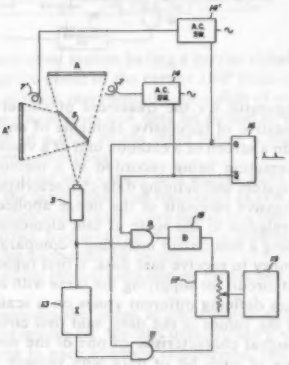
a spiral shelf provided about the longitudinal axis of the furnace assembly and about the inner shell, underlying the heating element and abutting against the outer lower surfaces of the insulating sleeves which enclose the lowermost winding of the heating element.

4,007,326

ELECTRONIC COPY ANALYSIS

Borg Bernsen, Buena Park, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 15, 1976, Ser. No. 649,301
Int. Cl.² G01B 9/08; H04N 7/18
U.S. Cl. 358—280 5 Claims



1. An apparatus for comparing the quality of a copy of a standard pattern to its original, comprising:

a vidicon:

a substantially half and half transmission/reflection mirror so interposed between said vidicon and the copy and the original that the image of the copy is superimposed on the image of the original formed on said vidicon;

means for illuminating the original and the copy in sucession in such a manner that said vidicon forms a video image of the original and a video image of the copy; and,

means for comparing the copy image to the original image and generating a comparison signal;

said means for comparing and generating a comparison signal includes;

a comparator;

delay means;

first gating means for gating the output of said vidicon to said comparator via said delay means;

inverting means for inverting the output of said vidicon;

second gating means for gating the output of said inverting means to said comparator;

means for actuating said first and second gating means in sucession in synchronization with the illumination of the original and the copy; and,

whereby said comparator receives the video images of the original and the copy simultaneously and generating the

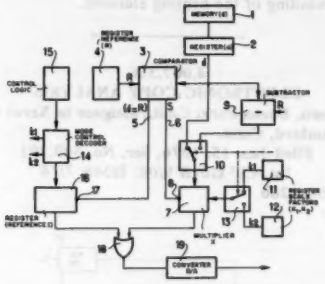
comparison signal indicative of the difference between the original and the copy.

4,007,327

APPARATUS FOR SELECTIVELY ALTERING IMAGE DATA FOR CRT DISPLAY IN ORDER TO FACILITATE IMAGE ANALYSIS

Alain Cousin, La Garenne Colombes, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed July 30, 1975, Ser. No. 600,480
Int. Cl.² H04N 5/22, 9/535
U.S. Cl. 358—160 **3 Claims**



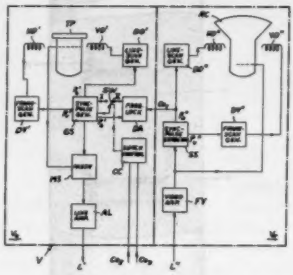
1. Apparatus for the treatment of numerical information representative of successive elements of an image to be displayed on a screen of a cathode unit of a visual display system, the information being recorded in a memory of the visual display system and defining data characteristic of the aspect of the successive elements of the image applied to the cathode unit in relation to the scale of said elements, said apparatus comprising a first circuit including a comparator connected to the memory to receive said data, a first register connected to said first circuit for supplying the same with at least one reference data defining different zones on a scale defining variations of the values of the data, said first circuit delivering an output signal characteristic of one of the zones according to the value of each bit of data with respect to the reference value, a multiplier circuit connected to and controlled by the output signal of the said comparator, a first control switch connected to said multiplier circuit, second registers memorizing different predetermined multiplication coefficients connected to said first control switch such that the multiplier circuit is capable, respectively, of expanding different zones of the data over the entire scale of values, a second control switch connected to said multiplier circuit, said second control switch having one input connected directly to the memory, a subtractor connected to said memory and said first circuit and capable of forming the difference between the value of each bit of the data and the value of each reference, said second control switch having a second input connected to said subtractor and a third register coupled to said comparator and memorizing at least one constant data value defined in the scale of values of the data and controlled by the output signal of the comparator, the output of the said third register and the output of the multiplier circuit forming the output of the treatment apparatus and comprising, additionally, a control circuit for one mode of treatment of the data selected from a number of treatment modes defined from the selection of each reference data of each constant value data and from a zone of the said scale, said control circuit being coupled to said first and third registers and to said switches to modify the values of the data delivered at the output of the treatment apparatus, and thus applied to the said cathode unit according to the selected mode of treatment.

4,007,328

VIDEOTELEPHONE SYSTEM WITH ANTI-CROSSTALK MEANS

Virgilio Mosca, Milan, Italy, assignor to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed Sept. 30, 1974, Ser. No. 510,757
Claims priority, application Italy, Oct. 2, 1973, 29619/73
Int. Cl.² H04N 5/04
U.S. Cl. 358—85 **10 Claims**



1. A videotelephone system with a plurality of stations adapted to enter into two-way communication with one another, each of said stations comprising:

an audio section provided with telephone equipment;

a video-transmission section including a television transmitter provided with a first frame-scan generator and a first line-scan generator;

a video-reception section including a television receiver provided with a second frame-scan generator independent of said first frame-scan generator and a second line-scan generator independent of said first line-scan generator;

a controllable sync-pulse source with output connections to said first line-scan and frame-scan generators and to an outgoing video line in a channel leading to a remote station temporarily communicating therewith;

a sync-pulse extractor with input connections to an incoming line in said channel and with output connections to said second line-scan and frame-scan generators; and

switchover means for operatively connecting said sync-pulse source to an output of said sync-pulse extractor to lock said first and second line-scan and frame-scan generators in step with one another for simultaneous transmission and reception of video signals with a common sync frequency upon establishment of communication with a remote station operating with a free-running sync-pulse source.

4,007,329

DATA COMMUNICATIONS SYSTEM WITH IMPROVED ASYNCHRONOUS RETIMING CIRCUIT

Herbert D. McClain, Quaker City; Bipin D. Parikh, and John K. Burkey, both of Cambridge, all of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Feb. 12, 1976, Ser. No. 657,426
Int. Cl.² H04L 7/00
U.S. Cl. 178—69.1 **40 Claims**

1. A timing recovery circuit for synchronizing digitally encoded asynchronous data with a retiming clock in a data communications channel, comprising:

means for detecting transitions in said data and for deriving a data clocking signal in substantial coincidence therewith;

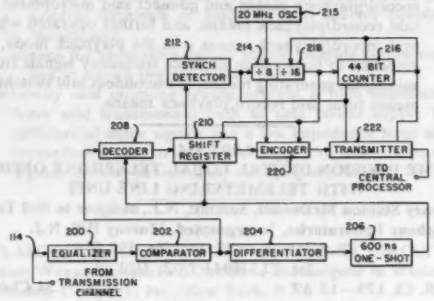
means responsive to said data clocking signal for decoding said data;

means for deriving an enabling signal in response to the decoding of a predetermined number and sequence of data bits;

means for generating a data retiming clock;

means for re-encoding said data for retransmission; and

data transfer means for coupling data from said decoding means to said transfer means with said data clocking



signal prior to the generation of said enabling signal and from said transfer means to the encoder with the retiming clock after the generation of said enabling signal.

4,007,330

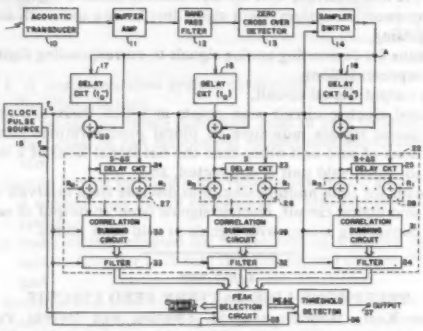
METHOD AND APPARATUS FOR DEMODULATION OF RELATIVE PHASE MODULATED BINARY DATA

Michael G. Winters, Canoga Park, Calif., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Aug. 13, 1975, Ser. No. 604,085

Int. Cl.² H04L *15/24*

U.S. Cl. 178—88 **10 Claims**



1. In a communication system employing a carrier on which binary signals have been modulated by reversing the phase of the carrier 180° for representation of one binary value and not reversing phase for representation of the other binary value, a method of demodulating binary digits modulated on said carrier comprising

conditioning the modulated carrier signal received in preparation for demodulation by phase comparison of each data bit period of said carrier with its succeeding data bit period,

delaying the conditioned carrier signal for a plurality of distinct periods with at least one delay period less than the nominal period of a data bit modulated on said carrier, one delay period equal to said nominal data bit period, and one delay period greater than said nominal data bit period,

phase comparing the conditioned carrier signal as delayed by said distinct periods in separate channels with the conditioned carrier signal undelayed, thereby demodulating said conditioned carrier signal with compensation for positive Doppler shift, no Doppler shift and negative Doppler shift, and

selecting the channel producing a signal having the most detectable binary signals in a first group of a number, N, of successive data bit periods.

4,007,331

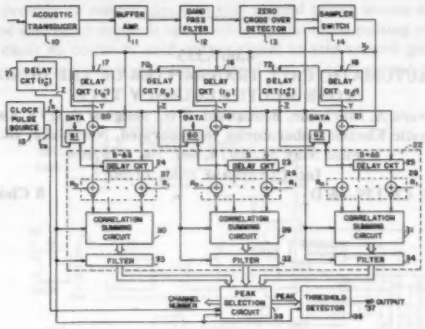
APPARATUS FOR DEMODULATION OF RELATIVE PHASE MODULATED BINARY DATA

Robert C. Flanagan, Westlake Village, Calif., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Aug. 13, 1975, Ser. No. 604,121

Int. Cl.² H04L *15/24*

U.S. Cl. 178—88 **12 Claims**



1. In a communication system having a carrier signal modulated by reversing the phase of the carrier 180° from one data bit period to the next for representation of a digit of one value and not reversing phase from one data bit period to the next for representation of a digit of the other value, a digital demodulation system comprising

means for converting said carrier to a square-wave electrical signal of the same phase and frequency as said carrier,

means for sampling said square-wave signal at a rate greater than said carrier frequency to produce a number, S, of sample bits for each data bit period,

first delay means for storing each sample bit for one data bit period,

means for comparing the phase of each stored sample bit with a current sample bit, thereby demodulating a sample bit in response to each in-phase comparison, and

means for integrating the last S demodulated sample bits over exactly one data bit period.

4,007,332

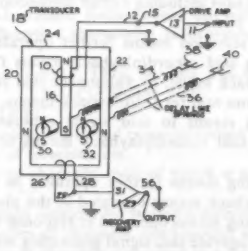
ARTIFICIAL REVERBERATION SYSTEM

Arne L. Berg, 13709 Allanwood Road, La Puente, Calif. 91746

Filed July 18, 1975, Ser. No. 597,283

Int. Cl.² H02K *33/18*; **H03H** *9/30*

U.S. Cl. 179—1 J **10 Claims**



1. An improved artificial reverberation system including:

an original signal input terminal;

a delayed signal output terminal;

a unitary electrodynamic transducer coupled to both said input terminal and said output terminal;

at least one spring coupled at one end to said transducer and at the other end to a fixed terminator;

said unitary transducer being responsive to an original signal applied to said input terminal to produce a travelling wave in said at least one spring;

said unitary transducer being responsive to a travelling wave reflected from said fixed terminator to produce a delayed signal at said output terminal;

and rejection means coupled between said input and output terminals for minimizing the level of said original signal appearing at said output terminal.

4,007,333

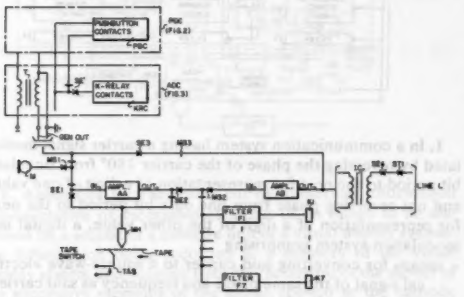
AUTOMATIC CALL TRANSMITTER OF THE DUAL TONE MULTIFREQUENCY TYPE

Edward A. Marheine, Brookfield, Wis., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed May 31, 1974, Ser. No. 475,004

Int. Cl.² H04M *1/00, 11/00*

U.S. Cl. 179—6 D **8 Claims**



1. A telephone reporting unit comprising:

record/playback means operable in both record and playback modes;

signal generating means connected to said record/playback means;

mode selection means including circuit connections to said signal generating means and to said record/playback means, initially operated manually to condition said record/playback means for operation in the record mode;

initiating means connected to said record/playback means, initially operated manually to render said record/playback means operable;

said signal generating means manually operated to generate at least one voice frequency signal;

said record/playback means operated in reponse to said generated voice frequency signal to record said signal;

switching means including circuit connections to said mode selection means;

said mode selection means further operated manually, to condition said record/playback means for operation in the playback mode, to disconnect said signal generating means from said record/playback means, to connect said switching means to said signal generating means and connect said record/playback means to said switching means;

said initiating means further operated to render said record/playback means operated in the playback mode;

said switching means operated in response to said recorded signal to operate said signal generating means to generate a voice frequency signal of the same frequency as said recorded signal;

and midcycle shift means connected to said signal generating means, and connected to a microphone, said midcycle shift means initially operated, when said record/playback means are in the record mode in response to termination of voice frequency signals from said signal generating means, to disconnect said generating means from said record/playback means and connect said microphone to said record/playback means, and further operated when said record/playback means is in the playback mode, in response to termination of voice frequency signals from said signal generating means, to disconnect said switching means from said record/playback means.

4,007,334

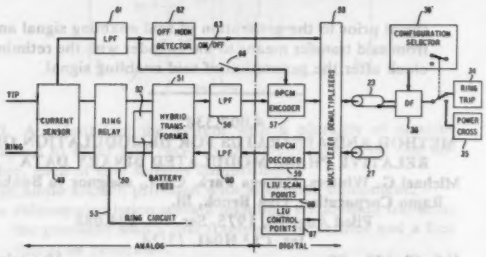
TIME DIVISION DIGITAL LOCAL TELEPHONE OFFICE WITH TELEMETERING LINE UNIT

Henry Stanton McDonald, Summit, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 2, 1975, Ser. No. 592,514

Int. Cl.² H04J *3/02, 3/12*

U.S. Cl. 179—15 AT **34 Claims**



27. A line interface unit for a switchable electric signal line interconnection system, each signal line having one such unit comprising,

means for converting analog signals to corresponding digital representations,

an output digital circuit,

plural electric circuit scan points at which there are produced signals indicative of plural predetermined functions of said unit other than the net signal level of a line to which said unit is connected, and

means for time multiplexing, into discrete time intervals on said digital circuit, electric signals from an output of said converting means with signals at said scan points.

4,007,335

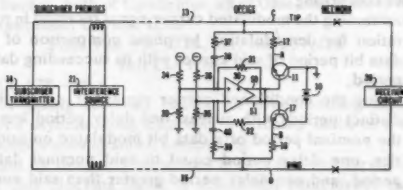
TELEPHONE LINE BATTERY FEED CIRCUIT

Irvine Keers Hetherington, St. Charles, and DeWitt Paul Smith, Naperville, both of Ill., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 12, 1975, Ser. No. 631,086

Int. Cl.² H04M *1/76*

U.S. Cl. 179—16 AA **11 Claims**



1. A circuit for supplying talking current from a power supply for a two-wire transmission path and for reducing undesirable common mode signals thereon comprising:

a first and a second controllable coupling means each comprising input, output, and control terminals for coupling said power supply to said transmission path; and

differential operational amplifier means comprising:

a first and a second input a.c. coupled to said transmission path;

a first and a second output respectively connected to said control terminals of said first and second coupling means; and

means for generating signals at said outputs corresponding to signals present at said inputs

whereby said coupling means present a high impedance from said transmission path to said power supply for differential mode signals and a low impedance from said transmission path to said power supply for common mode signals thereby substantially reducing the latter.

4,007,336

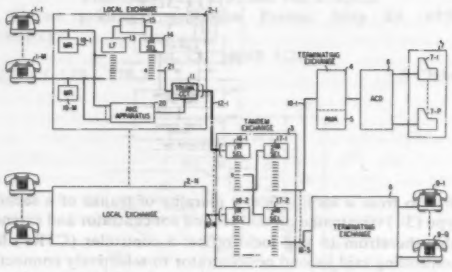
CLASS OF CALL DISCRIMINATING TRUNK CIRCUIT

Robert Wayne Hutton, Sr., Oaklawn, Ill., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Feb. 24, 1976, Ser. No. 660,938

Int. Cl.² H04M *7/00, 15/16*

U.S. Cl. 179—18 AH **19 Claims**



1. A communication system comprising

subscriber stations,

first means for billing individual ones of said stations for a first class of call established by said communication system,

second means for billing individual ones of said stations for a second class of call established by said communication system,

a trunk circuit adapted for connection to a calling one of said stations for both said first and second classes of calls, and

means in said trunk circuit responsive to coded signals from said calling station for selecting one of said first and second billing systems in accordance with the class of call defined by the coded signals received.

4,007,337

ARRANGEMENT AND METHOD OF ACHIEVING A DIAL PULSE MUTING FUNCTION IN A REGISTER SENDER PABX SYSTEM

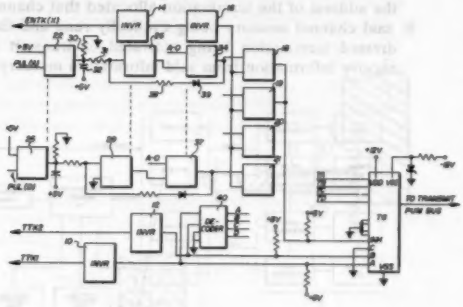
Lloyd L. Langsdorf, Streamwood; Lawrence J. Kusan, Glendale Heights, and Dinesh K. Srivastava, Westmont, all of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Dec. 22, 1975, Ser. No. 643,434

Int. Cl.² H04M *7/14;* H04Q *3/62*

U.S. Cl. 179—18 AH **7 Claims**

1. In a private automatic branch exchange telephone system of the register sender type having a plurality of trunk cards, each of said trunk cards having thereon a transmit gate, a receive gate and a plurality of trunk circuits, said trunk circuits on a trunk card each being selectively connectable via the transmit gate and the receive gate to a transmit bus and a receive bus, respectively, for extending calls from subscriber's line circuits and each including a pulse relay and a relay driver for operating the pulsing relay to generate dial pulses, a dial pulse being generated when a pulsing relay restores after being operated, each of the transmit and receive gates having an inhibit input and trunk identity inputs, a trunk circuit on a trunk card normally being selected and identified by coded signals coupled to the trunk identity inputs and a card enable signal coupled to the inhibit input, the improvement comprising a dial pulse muting arrangement for preventing a subscriber from hearing sender outpulsing, said arrangement comprising a first and a second gating means associated with each of said trunk circuits, the output of each of said first gating means being coupled to an input of said second gating means, the outputs of said second gating means all being coupled to said inhibit input of said transmit gate, said relay driver being coupled to and operating said first gating means to provide an output signal to said second gating means each time said relay driver is operated to operate said pulsing relay to close its contacts, said output signal to said second gating means being a delayed output signal and being removed sub-



stantially immediately when said relay driver releases said pulsing relay permitting it to restore, said card enable signal being coupled to another input of said second gating means and said second gating means being operated upon receipt in coincidence of said delayed output signal from said first gating means and said card enable signal to provide an output signal to said inhibit input of said transmit gate to enable said transmit gate, each time a pulsing relay associated with a selected trunk circuit on a selected trunk card is operated by its associated relay driver, said first gating means to which said relay driver is coupled being operated to provide said delayed output signal to said second gating means to thereby enable the latter to provide said output signal to said inhibit input of said transmit gate to enable said transmit gate, said first gating means removing said delayed output signal when said relay driver releases said pulsing relay so that said transmit gate is disabled before said pulsing relay can be restored, whereby said transmit gate is enabled after a pulsing relay restores.

4,007,338

SWITCHING AND TRANSMISSION TECHNIQUE USING A METHOD AND ARRANGEMENT OF CHANNEL ALLOCATION FOR PROVIDING CONFERENCING

Donald W. McLaughlin, Bolingbrook, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Sept. 18, 1975, Ser. No. 614,407

Int. Cl.² H04M *3/56*

U.S. Cl. 179—18 BC **14 Claims**

1. In a pulse code modulated communication system having

a. a plurality of terminations;

b. a plurality of channels, each of which is assigned a time slot;

c. an information memory for storing information from each of the plurality of channels, the transmit side of each of the plurality of channels appearing in a fixed location on one side of the information memory and the receive side of each of the plurality of channels appearing in a fixed location on the other side thereof,

d. a control memory having a control memory word corresponding to each of the plurality of channels for storing

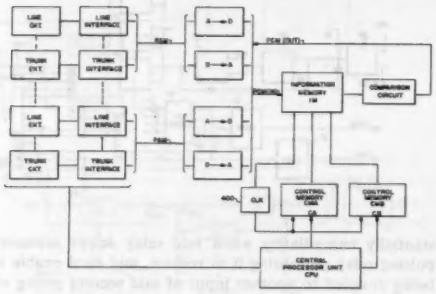
the address location within the information memory of the channel to which that channel is to be connected for conversation, and

e. control means for cyclically controlling the operation of the system, said control means during a time slot assigned to a channel writing the information from that channel into the information memory. reading the control memory word corresponding to that channel from the control memory to address the information memory to read out the information stored therein at the addressed location, and to transmit the information read therefrom to that channel, to thereby permit that channel to engage in conversation with another channel, the improvement comprising:

f. channel allocating means for allocating said channels to said terminations on a per call basis; and

g. a channel memory having channel memory words corresponding to each of the plurality of channels for storing the address of the termination allocated that channel;

h. said channel memory being cyclically read and the addressed termination being activated to transmit to or receive information from said information memory;



i. a second control memory having a control memory word corresponding to each of the plurality of channels for storing the address location within the information memory of a second channel to which that channel is to be connected for conversation, and

j. a comparison means for comparing a transmitting as an output thereof the larger of two samples of information coupled to it,

k. said control means during a time slot assigned to a channel writing the information from that channel into the information memory, reading the control memory words corresponding to that channel from each of the control memories for addressing the information memory to read out the information stored therein at the two addressed locations, and to transmit the information to said comparison means, the largest of the two samples of information coupled to said comparison means being coupled to that channel,

l. whereby 3-way conferencing between the plurality of channels can be provided.

4,007,339

ARRANGEMENT SERVING OPERATOR ASSISTANCE CALLS REQUIRING ROUTING BACK TO ORIGINATING OFFICES

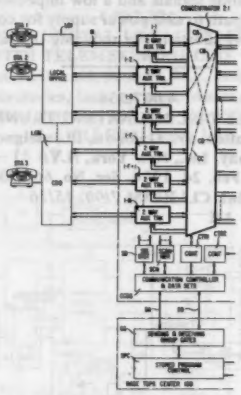
Amos Edward Joel, Jr., South Orange, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 28, 1975, Ser. No. 636,027

Int. Cl.² H04M *3/60*

U.S. Cl. 179—27 FF **11 Claims**

1. A traffic service position system comprising a plurality of operator positions (OPPOSI-OPPOSN), a plurality of toll trunks (2-) terminated in a toll office, network and transmission means for connecting said toll trunks to said operator positions including a first concentrator (8:1) connecting said toll trunks to transmission paths (BRT1-BRTN) extendable to said operator positions, and CHARACTERIZED IN THAT said system further comprises a second concentrator (2:1) terminating said toll trunks thereon and physically associated with said first concentrator; a plurality of trunks of a first type (1-) terminated on said second concentrator and extending



thereto from a local office; a plurality of trunks of a second type (3-) terminated on said second concentrator and extendable therefrom to said local office; a controller (CTR1) for controlling said second concentrator to selectively connect a calling one of said first type trunks to one of said second type trunks or to one of said toll trunks dependent upon the destination of the call; and wherein said network and transmission means also connect said second type trunks to said operator positions.

4,007,340

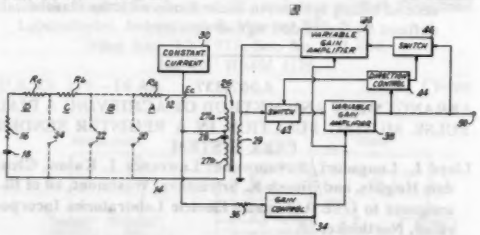
DISTANCE-RELATED VARIABLE GAIN AMPLIFIER

Taft B. Russell, Edison, N.J., assignor to Edison Control Corporation, Metuchen, N.J.

Filed Feb. 25, 1975, Ser. No. 552,788

Int. Cl.² H04B *3/36*

U.S. Cl. 179—170 R **2 Claims**



1. Apparatus for communicating electrical information signals between a given location and a remote location, the remote location being variably spaced from said given location and being connected thereto via electrical conductors such that the resistive impedance between said given and remote locations is a function of the distance therebetween, comprising an amplifier connected in series between said given location and said remote location for variably amplifying the electrical information signals communicated therebetween, said amplifier having a gain determinative feedback

resistive element comprised of a transconductance amplifier having a transconductance g_m that is a function of a current supplied thereto such that the feedback current of said amplifier varies proportionately with said supplied current; a source of constant current coupled to said electrical conductors for supplying a current of predetermined constant magnitude thereto; means for deriving a voltage that is a function of the product of said current and said resistive impedance between said given and remote locations; and a linearizing circuit responsive to said derived voltage for supplying said current to said transconductance amplifier such that said gain of said amplifier is linearly related to said resistive impedance between said given and remote locations, whereby said gain is increased as said distance is increased.

4,007,341

ECHO CANCELLING DEVICE

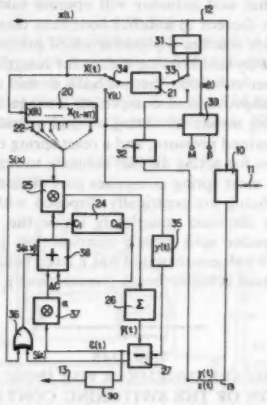
Jacques Sourgens, Massy; Dominique Lajotte, Ris Orangis, and Francois Michelon, Bretigny-sur-Orge, all of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed May 12, 1975, Ser. No. 576,423

Claims priority, application France, May 24, 1974, 74.18115

Int. Cl.² H04B *3/20*

U.S. Cl. 179—170.2 **5 Claims**



1. Echo canceller comprising a transversal filter, to form a synthetic echo signal $\hat{y}$ (t) effecting a convolution of N samples X (t) each coded on n bits of a received signal x (t), recorded in a first memory and of N filtration weighting samples C obtained by correlation of the residual echo signal $\epsilon(t)$ and of the samples $X(t)$ and recorded in a second memory, a digital subtractor forming the residual echo signal $\underline{\epsilon}(t)$ coded on n bits based on the true echo signal y (t) and on the synthetic echo signal $\hat{y}$ (t), means for determining the absolute value of the residual echo signal, means for determining the sign of the variations of the weighting coefficients, and means including an adaptive control loop for adjusting the filtration weighting coefficients C from the absolute value of the said residual echo signal and from the correlation of the signs of N samples X (t) of the received signal and of the residual echo signal determining the sign of each of the variations of the filtration weighting coefficients C, said filtration weighting coefficients C in said first memory being less than 2^n, and being recorded in the said second memory each on $n+m$ bits, said adaptive control loop including a first adder having $(n+m)$ first inputs receiving the successive filtration weighting coefficients and having $(n+m)$ second inputs receiving the residual echo signal $\underline{\epsilon}(t)$ multiplied by a coefficient α close to zero and accompanied by the sign of the correlation of the signs effected, m being the minimum number of bits necessary for representing the reverse of the coefficient α, said second adder sending out the filtration weighting coefficients to the said second memory to which it is looped.

4,007,342

INTERNAL COMBUSTION ENGINE DISTRIBUTOR HAVING OXIDIZED ELECTRODES OR TERMINALS

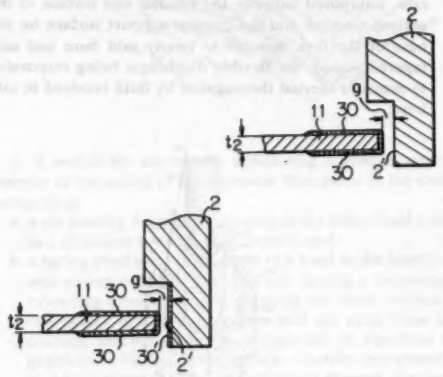
Takayuki Makino, Okazaki; Masahiko Nagai, Toyota; Teruo Yamanaka, Toyota, and Osamu Hori, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Apr. 10, 1975, Ser. No. 566,935

Claims priority, application Japan, June 25, 1974, 49-72663

Int. Cl.² H01H *19/00, 1/00*

U.S. Cl. 200—19 R **9 Claims**



1. A distributor for an internal combustion engine, containing an apparatus for suppressing noise, comprising:

a distributor rotor which is electrically connected to a high voltage generator included in an ignition circuit of the internal combustion engine, said rotor comprising an electrode;

a plurality of stationary terminals, each of which comprises an electrode, is electrically connected to a corresponding spark plug, and is arranged along a circular locus defined by the rotating distributor rotor with a discharging gap between the electrodes of the terminals and the electrode of the distributor rotor, and the surface of at least one of the electrodes of the distributor rotor and the stationary terminals is formed by an electrically high resistive layer of an oxide.

4,007,343

METHOD AND APPARATUS FOR SENSING FLUID PRESSURE

Ralph W. Alten, East Detroit, Mich., assignor to Dynamic Industries, Inc., Warren, Mich.

Filed Jan. 5, 1976, Ser. No. 647,258

Int. Cl.² H01H *35/34*

U.S. Cl. 200—83 J **1 Claim**

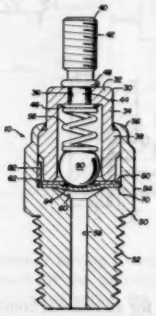
1. A pressure switch for use in an electrical circuit for monitoring fluid pressure, comprising:

a housing comprised of first and second attached members defining an enclosed recess, the first member being comprised of steel, being electrically conductive and having (a) a threaded, essentially cylindrical base for connection to a fluid pressure source, (b) an essentially annular

collar concentric with and extending away from the base, and (c) a bore extending through the length of the base to receive fluid under pressure, the bore terminating adjacent the collar in an outwardly flared tapered region to form an annular support surface on one end of the cylindrical base in the housing recess, said first member forming a part of the electrical circuit when the pressure switch is connected to a power source;

the second member being comprised of polyester resin and being unitary, essentially cup-shaped, and being electrically non-conductive, and including (a) an essentially tubular portion received within the annular collar of the first member and terminating in an annular end surface and (b) a base at the distal end of the tubular portion with respect to the base of the first member, the base of the second member having an opening therein and receiving an electrical terminal element for connection to an electrical power source for monitoring fluid pressure;

an elastomeric, flexible diaphragm within the housing recess, interposed between the annular end surface of the second member and the annular support surface on the base of the first member to overly said bore and said tapered region, the flexible diaphragm being responsive to pressure exerted thereagainst by fluid received in said bore;



an essentially annular electrical contact element interposed between and in abutting contact with both the flexible diaphragm and the annular end surface of the second member, said annular contact element including a tab member in engagement with the first housing member to establish electrical communication therebetween;

an electrically conductive coil spring within the housing recess and being in contact with said electrical terminal element; and

an axially movable, spherical, electrically conductive metal ball interposed between and in engagement with both said coil spring and the flexible diaphragm, said metal ball being concentrically aligned with the annular contact element and having a diameter at least slightly greater than the diameter of the opening in the annular contact element to selectively establish essentially only annular line contact therebetween, the metal ball having a diameter substantially the same as but slightly less than the inner diameter of the tubular portion of the second housing member and the compression spring maintaining the metal ball in engagement with the annular contact element during low fluid pressure to establish a closed electrical circuit through the pressure switch, and the flexible diaphragm displacing the metal ball toward the base of the second housing member during relatively high fluid pressure to discontinue electrical communication between the metal ball and the annular contact element.

4,007,344

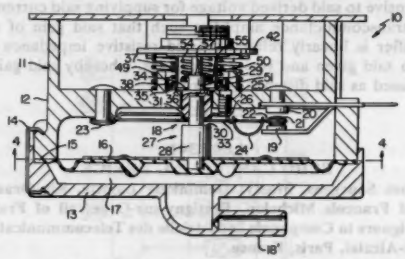
PRESSURE OPERATED ELECTRICAL SWITCH CONSTRUCTION

George M. Hipple, Columbus, Ohio, assignor to Robertshaw Controls Company, Richmond, Va.

Filed Aug. 12, 1975, Ser. No. 604,025

Int. Cl.² H01H *35/34*

U.S. Cl. 200—83 SA **39 Claims**



1. In a pressure operated electrical switch construction comprising a housing means, a pressure responsive actuator carried by said housing means, an electrical switch carried by said housing means and being operatively associated with said actuator so that said actuator will operate said switch from one condition thereof to another condition thereof when the sensed pressure reaches a predetermined pressure, and reset means carried by said housing means for resetting said switch from said other condition thereof back to said one condition thereof, the improvement comprising a range spring carried by said housing means for acting on said actuator to provide said predetermined pressure, and a reset spring carried by said housing means for acting on said actuator to reset said switch whereby said reset spring comprises part of said reset means, said springs being concentrically disposed with one of said springs being disposed completely inside the other of said springs to render said switch construction compact even though said switch construction has a fixed reset or a proportional reset, said actuator being concentrically disposed with said springs.

4,007,345

INDICATING ARRANGEMENT FOR INDICATING THE CONDITION OF THE SWITCHING CONTACTS OF A SWITCHING VESSEL IN A VACUUM-SWITCH APPARATUS

Werner Kohler, Bentfeld, Holstein, and Norbert Steinemer, Berlin, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Jan. 23, 1975, Ser. No. 543,544

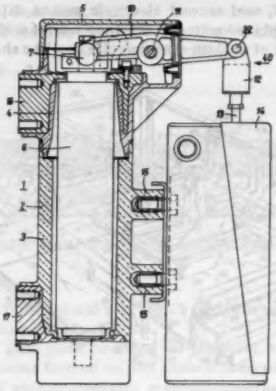
Claims priority, application Germany, Jan. 31, 1974, 2405149

Int. Cl.² H01H *33/02*

U.S. Cl. 200—144 R **4 Claims**

1. In an arrangement which includes a vacuum-switch having a switching vessel with switching contacts at least one of which is movable and an actuator equipped with actuating means movable between first and second positions to open and close said switching contacts respectively, the actuating means including an actuator rod coupled to the actuator and a lever for acting on the movable switching contact, an indicating arrangement comprising: a spring coacting with said actuating means for pressing said switching contacts together when the actuating means is moved to the second position, said spring having a length at said second position dependent upon the wear condition of the contacts; a coupling member arranged between the actuator rod and the lever, said coupling member including first and second parts movable relative to each other against the force of said spring and connectable to said actuating rod and said lever respectively; and,

indicating means for indicating the relative displacement of said parts, said displacement being dependent upon changes



of length of said spring occurring as the switching contacts are worn from repeated switching operation.

4,007,346

ENCAPSULATED SWITCHING INSTALLATION

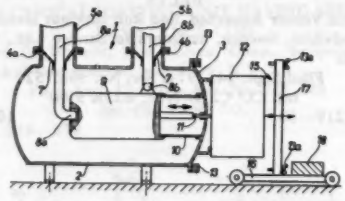
Wilhelm Gaigg, Oberentfelden, Switzerland, assignor to Sprecher & Schuh AG, Aarau, Switzerland

Filed Oct. 10, 1974, Ser. No. 514,032

Claims priority, application Switzerland, Nov. 27, 1973, 16648/73

Int. Cl.² H01H *33/54*

U.S. Cl. 200—148 R **8 Claims**



1. An encapsulated switching installation with a substantially cylindrical tank closed tight with insulating medium at both ends and a switching device in the tank and having contacts connectable to a conductor of through-passages secured at the tank and can be actuated by a drive mechanism located externally of the tank, the improvement comprising a switching device having at least one switch element mechanically fixedly connected to a structural unit with a removable cover forming a tank closure, the structural unit being insertable into a tank by movement in direction of the longitudinal axis of the tank and being removable out of the tank, the connection contacts of the switching device comprising plug connections which upon insertion of the structural unit into the tank close and upon removal of the structural unit out of the tank open, and a traveling mounting device with a support frame secured to the tank cover of the structural unit to be removed, for the movement of the structural unit, at a tank cover secured at the inside of a tank external flange there is connected insulatingly with respect to ground a two- or three-pole switch element by means of an insulating support, said switch element having a drive rod piercingly extending through the cover, the drive mechanism with a polewise driven switch element being mounted externally at the cover and together therewith, the switch element forming a structural unit, the end of the drive rod with a three pole driven switch element protruding from the cover and carrying a coupling portion.

4,007,347

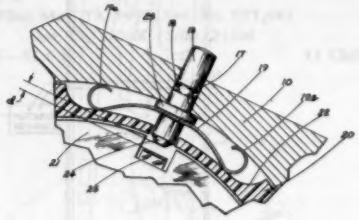
SIMPLIFIED ACTUATING SWITCH FOR ELECTRONIC TIMEPIECES

Terry M. Haber, 3050 S. Bristol, No. 8C, Santa Ana, Calif. 92707

Filed July 28, 1975, Ser. No. 599,647

Int. Cl.² H01H *13/50;* **G04B** *27/00, 37/00*

U.S. Cl. 200—159 R **6 Claims**



1. A switch for electrically connecting a module contact interior of the casing of an electronic time-piece to the casing comprising:

a. a pin passing through an opening in the side of said casing in a direction towards said contact; and

b. a spring conductor in the form of a band in the interior of said casing engaging said pin and having a transversely extending curved portion engaging the inner surface of said casing in a manner to bias said pin away from said contact, said spring being continuously in electrical engagement with said inner surface, whereby movement of said pin against the bias of said spring through the opening in said casing towards said contact causes the inner end of said pin to engage said contact to thereby electrically connect said contact to said casing through said pin and spring conductor.

4,007,348

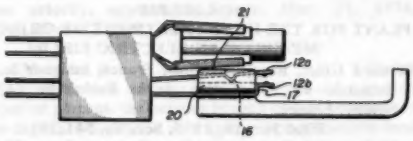
SPRING CONTACT ASSEMBLY

Darryl Jay VanSon, Brookfield, and Kent Gordon Blackman, Sycamore, both of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Dec. 24, 1975, Ser. No. 644,361

Int. Cl.² H01H *15/02*

U.S. Cl. 200—283 **7 Claims**



1. A spring contact assembly comprising a pair of substantially parallel spring contacts which are normally closed, at least one of said pair of spring contacts having a cam on it; and an actuator slidably supported by said pair of spring contacts, said actuator having a portion thereof disposed between said pair of spring contacts and forming a cam surface which engages said cam on said one spring contact to open said pair of spring contacts when said actuator is slidably translated longitudinally along the length of said pair of spring contacts.

4,007,349

INDUCTIVE METHOD FOR CUTTING CLOTH

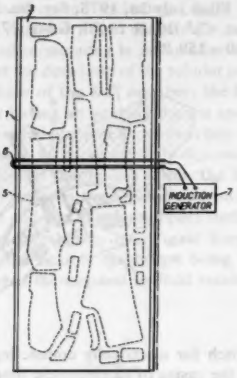
John Charles Burley, 47a Southwick St., Southwick, Brighton, Sussex BN4 4TH, England

Continuation-in-part of Ser. No. 442,582, Feb. 14, 1974, abandoned. This application Dec. 2, 1974, Ser. No. 529,000

Claims priority, application United Kingdom, Feb. 14, 1973, 7166/73

Int. Cl.² H05B *5/02*

U.S. Cl. 219—10.43 **6 Claims**



1. A method of preparing garment sections for sewing together to make a garment such as a suit or coat, the method comprising the steps of:

taking an array of electrically conductive strip elements arranged with one edge of each element lying in a common plane, each of said elements being bent into the shape of a respective garment section required in making up the garment,

positioning adjacent the said one edges of the elements a piece of cloth of predetermined length and width at least equal to the length and width of said array,

positioning an elongate induction heating electrode adjacent the side of said cloth remote the array, said electrode extending across the width of said array,

supplying high frequency electrical energy to said electrode to heat the strip element edges closest thereto to a temperature sufficient to sever the cloth, and

causing relative movement of said array and said electrode whilst maintaining the relative positions of said cloth and said array, and whilst contacting the cloth with the said heated edges to thereby sever garment sections progressively from the said piece of cloth as said relative movement is carried out.

4,007,350

PLANT FOR THE HEAT TREATMENT OF OBJECTS BY MEANS OF AN ELECTRIC FIELD

Bernard Gillet, Rosny sur Bois, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly, France

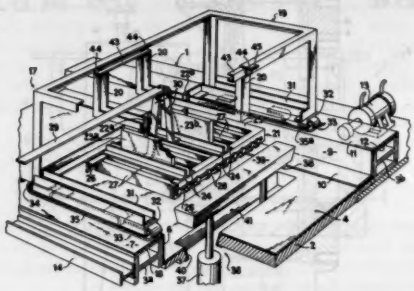
Filed Jan. 16, 1975, Ser. No. 541,391

Claims priority, application France, Jan. 23, 1974, 74.02202

Int. Cl.² H05B *9/02*

U.S. Cl. 219—10.81 **16 Claims**

1. A plant for the heat treatment of objects comprising: a frame having an elongated shape, a high frequency generator having a pair of terminals supplied respectively with high voltage and constant ground potential, first electrode means fixedly mounted on said base and extending longitudinally thereof, said first electrode means having a bottom portion and side wall portions defining an elongated open space adapted to receive objects to be treated, second electrode means electrically insulated from said first electrode means and mounted on said frame so as to be movable along the length thereof, said second electrode means extending substantially in a plane located at the open side of said space so as to cover a part of the latter, a generally box-like shaped shield-



ing structure containing at least a part of said second electrode means and being connected thereto by insulating means, said structure having an open side facing said open side of said space, and slidable contact means rigid with said structure and making electrical contact with said first electrode means, whereby said first and second electrode means are respectively connected to said pair of terminals of said generator.

4,007,351

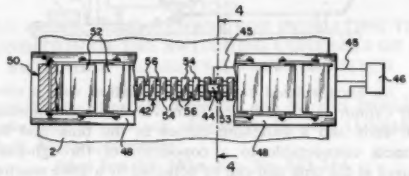
SYSTEM FOR INSTALLING HIGH STRENGTH STEEL BELTS

Karl Bertil Verner Annerhed, and Rolf Ingemar Hemlin, both of Sandviken, Sweden, assignors to Sandco Ltd., Ottawa, Canada

Filed Sept. 24, 1974, Ser. No. 508,752

Int. Cl.² C21D *1/18;* **B23K** *9/00*

U.S. Cl. 219—50 **10 Claims**



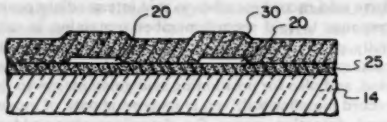
1. The method of installing an endless steel belt upon a machine for producing a product where the product is held under pressure by the belt under tension, the steps of, installing a belt and band long the path of the belt in the machine wherein the belt band is of a steel which has been precipitation hardened to a predetermined high tensile strength, positioning the ends of the belt band in substantially end-to-end abutting relationship, clamping the belt portions adjacent said ends in said relationship, welding said ends together using welding wire of steel having the same characteristics as those of the belt band to form a weld joint, heat-insulating said weld joint without removing the belt band from the machine, heating said weld joint with electric heating means to a temperature which will produce precipitation hardening of said weld joint, and controlling said heating and terminating it at the end of the period required to increase the yield strength and tensile strength of said weld to substantially the strength of the belt band.

4,007,352

THIN FILM THERMAL PRINT HEAD

Frank Ura, Palo Alto, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed July 31, 1975, Ser. No. 601,115
Int. Cl.² H05B 1/00
U.S. Cl. 219—216 4 Claims



WITH ALUMINUM OXIDE UNDERLAYER

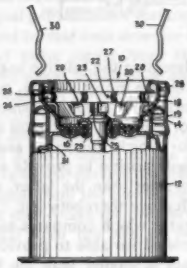
1. A thin film thermal print head comprising:
an aluminum oxide substrate;
a layer of glass glaze covering the substrate having a plurality of mesas formed on the surface thereof;
a layer of etchant-resistant material covering the layer of glass glaze including the plurality of mesas and having a high chemical resistance to photoresist materials;
a layer of resistive material covering the etchant-resistant material in the area of the mesas to form resistive heater elements thereon;
a plurality of electrical conductors coupled to the heater elements for connecting electrical power thereto;
a layer of oxide of the resistive material covering each of heater elements; and
a layer of wear-resistant material covering the layer of oxide and having a relatively high thermal conductivity.

4,007,353

ELECTRICAL IGNITING UNIT HAVING SPIRAL RESISTANCE COIL

Laurence G. Horwitt, New Haven, Conn., assignor to Sun Chemical Corporation, New York, N.Y.

Filed Aug. 17, 1976, Ser. No. 715,148
Int. Cl.² F23Q 7/22
U.S. Cl. 219—270 3 Claims



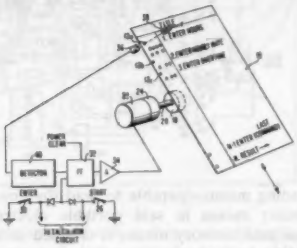
1. An electrical igniting unit for use with the holders of cigar lighters, comprising in combination:
a. a shallow metal cup having a relatively thin annular side wall,
b. a coiled heating resistance element disposed in said cup and having an outer end juxtaposed to and extending along the side wall thereof,
c. the entire edge of the side wall of the cup being inwardly crimped over and firmly sandwiching said outer end of the heating element whereby said end is both permanently mechanically secured to the side wall and electrically connected thereto,
d. means carried by the cup, providing an electrical connection to the inner end of the heating element, the outer annular wall surface of the cup being adapted for engagement with a cooperable metal electrical contact of an igniting unit holder whereby a complete circuit can be established through the heating element,
e. said outer wall surface of the cup being nitrided by subjecting the entire cup to a low temperature nitriding process.

4,007,354

CALCULATOR AND MEDIUM WITH COMMANDS FOR CALCULATOR OPERATION

Samuel A. Schwartz, 12743 Arroyo de Arguello, Saratoga, Calif. 95070

Filed Mar. 13, 1975, Ser. No. 557,941
Int. Cl.² G06K 15/00, 21/04
U.S. Cl. 235—61.6 R 11 Claims



1. An electronic calculator apparatus having arithmetic calculating circuitry and storage registers, for cooperating with a medium including means for indicating stop positions at which said calculator is to receive input data and having coded instructions following each stop position comprising:
a set of alphanumerical entry keys;
an entry key;
means for accepting said record medium, including guide means;
drive means for engaging said medium and for stepping said medium from one stop position to the next; and
sensing means for sensing the coded instructions following each stop position of said medium, so that the circuitry of said calculator will operate in response to said coded instructions employing the numbers entered by said numerical entry keys at such stop position.

4,007,355

DATA-TRANSFER SYSTEM

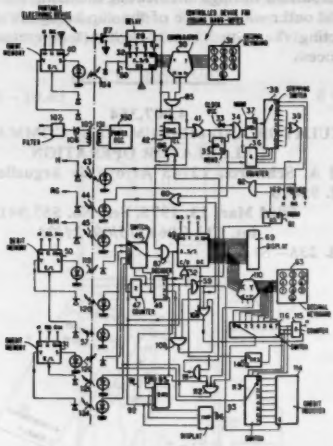
Roland Moreno, Paris, France, assignor to Societe anonyme dite: Societe Internationale pour l'Innovation, France

Filed Mar. 21, 1975, Ser. No. 560,874
Claims priority, application France, Mar. 25, 1974, 74.10191; Mar. 17, 1975, 75.08186
Int. Cl.² G06K 1/14, 19/00; G07F 7/02
U.S. Cl. 235—61.7 R 7 Claims

1. A system for data transfer between a first and a second population of persons, the persons in each of said populations being at dispersed locations, said system being characterized by including:
a. a plurality of independent data recording devices placed at fixed locations;
b. a plurality of first portable electronic devices each carried by a respective one of said persons, each said portable electronic devices comprising:
b_1. first memory means;
b_2. coupling means operable at will temporarily to couple said first memory means to one of said data recording devices;
b_3. memory control circuits coupled with said coupling

means and said memory means; said memory means and said memory control circuits being in the form of logic micro-structures;

c. each said data recording device comprising:



c_1. reading means operable to read the contents of said memory means in said portable electronic devices when said memory means is coupled to said data recording device by said coupling means;

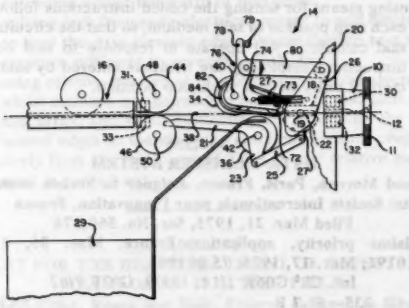
c_2. data recording means coupled to said reading means to record data reading thereby.

4,007,356

CARD RETRIEVAL MEANS

Arthur W. Stucke, Dayton, and Richard P. Taylor, Xenia, both of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Dec. 10, 1975, Ser. No. 639,313
Int. Cl.[2] G06K *13/20*; B65H *5/22*
U.S. Cl. 235—61.11 R **11 Claims**



1. A record member transport and capture mechanism for use with a wall with an opening therein to receive a record member, comprising:

first detecting means for detecting the position of a record member partially protruding from said opening;

timing means initiated by said first detecting means for timing a predetermined period commencing with the positioning of said record member in said partially protruding position;

guide means movable between two positions, in a first of which the record member will pass thereby in a normal path of movement, and in a second of which the card will be deflected from its normal path of movement;

first driving means for driving a record member inserted through the opening to a second position, and from said second position to said partially protruding position, with the guide means in said first position;

second driving means for driving said record member from said partially protruding position to an intermediate position;

operating means for operating said second driving means to drive said record member to said intermediate position in response to said record member remaining in said partially protruding position without being removed by a customer for a time in excess of said predetermined period, and also for positioning said guide means so that the record member is driven in its normal path of movement;

second detecting means for detecting when said record member has been driven into said intermediate position; and

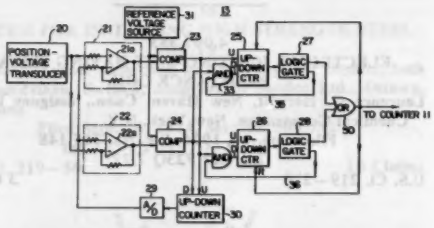
means responsive to said second detecting means for operating said first drive means to drive said record member toward said guide means and for causing said operating means to position said guide means to cause said record member to be deflected from its normal path of movement.

4,007,357

CIRCUIT FOR DETECTING RELATIVE ANGULAR DISPLACEMENT OF A STEERING WHEEL

Takayuki Yanagishima, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed July 31, 1975, Ser. No. 600,925
Claims priority, application Japan, Aug. 2, 1974, 49-88709
Int. Cl.[2] G08B *21/00*; G06M *3/02*, *3/14*
U.S. Cl. 235—92 EV **14 Claims**



1. A circuit for detecting the relative angular displacement of the steering wheel of a motor vehicle, comprising:

means for translating the angular position of said steering wheel into a corresponding electrical signal:

a first comparator which compares said electrical signal with a controlled variable to provide a first output when the former is greater than the latter, said output representing the difference therebetween;

a second comparator which compares said electrical signal with said controlled variable to provide a second output when the former is smaller than the latter, said second output representing the difference therebetween;

a third comparator which compares said first output with a reference value to provide a third output;

a fourth comparator which compares said second output with said reference value to provide a fourth output;

feedback circuit means for controlling said variable to decrease the magnitude of said first and second outputs to a value smaller than said reference value;

a first up-down counter operable in count-up mode in response to said third output and in count-down mode response to said fourth output;

a second up-down counter operable in count-up mode in response to said fourth output and in count-down mode in response to said third output; and

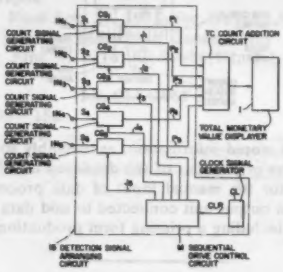
means coupled to the output of each of said first and second

up-down counters to provide an output when a predetermined count is reached.

4,007,358
COUNT CONTROL SYSTEM FOR COIN COUNTING MACHINE

Masayuki Iguchi, and Toshihisa Kosaka, both of Himeji, Japan, assignors to Glory Kogyo Kabushiki Kaisha, Japan

Continuation of Ser. No. 455,727, March 28, 1976, abandoned. This application Nov. 11, 1975, Ser. No. 630,887
Claims priority, application Japan, Apr. 5, 1973, 48-38248; Apr. 6, 1973, 48-39335
Int. Cl.² G06M *3/08*; G07D *9/00*
U.S. Cl. 235—92 CN **1 Claim**


COUNT SIGNAL GENERATING CIRCUIT
TC COUNT ADDITION CIRCUIT
TOTAL MONETARY VALUE DISPLAYER
CLOCK SIGNAL GENERATOR
15 DETECTION SIGNAL ARRANGING CIRCUIT
16 SEQUENTIAL DRIVE CONTROL CIRCUIT

1. A count signal arranging circuit for a control system for rearranging detection signals from a plurality of coin detectors into count signals with predetermined timing so that said counting signals can be totalized by a count addition circuit said count signal arranging circuit comprising:

a. a clock signal generator for generating clock signals;

b. a sequential drive signal forming circuit coupled to said clock signal generator for forming sequential drive signals each made up of a set of clock signals generated by said clock signal generator, and for sequentially and cyclically producing the sequential drive signals respectively at different times for the respective coin detectors; and

c. a count signal generating circuit for each coin detector coupled to said sequential drive signal forming circuit and said clock signal generator for forming, when a detection signal produced by said coin detector is applied thereto, a predetermined pulse signal from clock signals of the sequential drive signal, which pulse signal is a count signal for the corresoinding coin detector, each count signal generating circuit comprising: an input signal detection circuit for the corresponding coin detector, which, at the occurrence of a clock signal on the leading edge of the sequential drive signal, detects the presence or absence of a detection signal from the corresponding coin detector, and thereafter memorizes the presence or absence of the detection signal until the end of the sequential drive signal; and

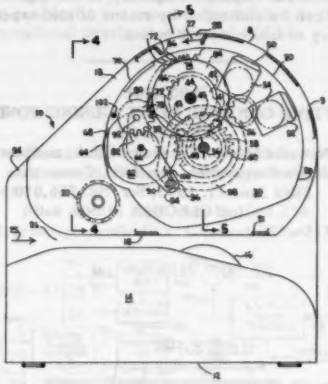
a count pulse generating circuit coupled to said input signal detection circuit for forming, at the occurrence of the clock signal on the trailing edge of the sequential drive signal, a predetermined pulse signal which is a count signal based on the memory content of said input signal detection circuit which has been stored therein.

4,007,359
POSTAGE METER

Frederick L. Ford, Bradenton, Fla., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Aug. 14, 1975, Ser. No. 604,724
Int. Cl.² G07G *1/00*
U.S. Cl. 235—101 **19 Claims**

1. A postage meter having a drum support and a rotatable drum carried for rotation upon said support, said rotatable drum comprising a directly accessible, hand manipulative postage value selector means supported by, an rotatable with said drum for manually setting a postage value to be printed, a variable postage value printing means supported by said drum for rotation therewith and operatively connected to said selector means, said printing means printing an amount of postage in accordance with the amount set by said selector means, and a postage registering means supported by said

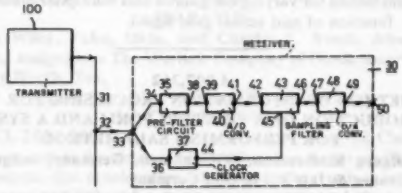


drum for rotation therewith and operatively engageable with said selector means for accounting for postage which is set and printed, said printing means and said registering means being operative only when said drum is caused to rotate from a rest position through a postage metering cycle, said postage printing means comprising at least one rotatable die wheel having a plurality of postage values upon a periphery thereof, the die wheel being rotatably movable between an offset print position and a properly aligned print position upon rotation of said drum from the rest position through said metering cycle.

4,007,360
METHOD AND APPARATUS FOR REMOTE TRANSMISSION OF SIGNALS

Roger Kniel, Uster, and Hans de Vries, Illnau, both of Switzerland, assignors to Zellweger AG, Uster, Switzerland

Filed Dec. 3, 1973, Ser. No. 421,086
Claims priority, application Switzerland, Dec. 28, 1972, 18981/72
Int. Cl.² G06F *15/30*; G01R *27/02*
U.S. Cl. 235—152 **10 Claims**



1. In an apparatus for the reception of remotely transmitted signals, which signals are transmitted via a conductor, especially via an electrical energy supply network, wherein there is provided a transmitter controlled by a first auxiliary frequency for generating a signal frequency which is in a first predetermined relationship to said first auxiliary frequency; a receiver; transmission channel means interposed between said transmitter and receiver for transmitting a signal characteristic of the first auxiliary frequency and for further transmitting the signal frequency between the transmitter and the receiver;

the improvement comprising:

a. the receiver incorporating at least one digital sampling filter, said digital sampling filter having a first input to which there is delivered a signal as sampling pulses possessing a predetermined repetition frequency and further having a second input to which there is delivered the signal frequency as the received signal, the signal serving as the sampling pulses being defined by the auxiliary frequency; and

b. wherein the response frequency of the digital sampling filter can be controlled by means of said repetition frequency of said sampling pulses.

4,007,361

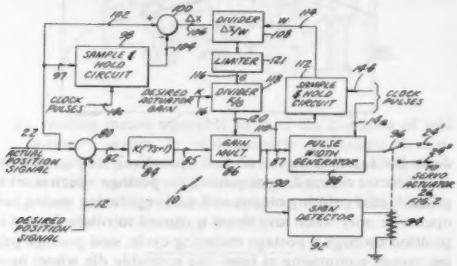
ADAPTIVE CONTROL SYSTEM USING POSITION FEEDBACK

Anthony Newman Martin, Simsbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed June 11, 1975, Ser. No. 586,010

Int. Cl.² G05B *13/00*

U.S. Cl. 235—150.1 **12 Claims**



1. An adaptive control system for positioning a controlled device in response to desired position signals and desired gain signals provided by a signal source, comprising

means for producing a signal indicative of the actual position of said controlled device,

means for summing said actual position signal with said desired position signal and producing a position error signal proportional to the difference therebetween,

multiplier means for applying a gain to said error signal to produce therefrom a control signal,

servo means responsive to said control signal for varying the position of said controlled device,

means responsive to the change in position of said controlled device produced by said control signal for generating an actual gain signal,

and means for varying the gain of said multiplier means as a function of said actual gain signal.

4,007,362

METHOD OF INFORMATION PROCESSING FOR THE PRODUCTION OF A PRINTING FORM AND A SYSTEM FOR PERFORMING SAID METHOD

Wolfgang Sindermann, Willinghusen, Germany, assignor to Gruner & Jajr AG & Co., Germany

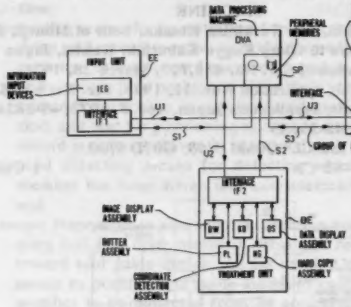
Filed June 23, 1975, Ser. No. 589,782

Claims priority, application Germany, June 26, 1974, 2430762

Int. Cl.² H04N *1/06*; G06F *3/14*

U.S. Cl. 235—151 **30 Claims**

15. A system for information processing for the production of a printing form for the printing of an original, comprising an input unit including at least a scanner for scanning an original with a driven scanning head producing electrical image signals, control means for the drive means of said scanning head, which control means allows the free selection of the scanning point sequence of the scanning head, information forming means for digitalizing said image signals; a data processing machine connected to said input unit and including memory means and a central processing unit; a treatment unit connected to said memory means and said central processing unit, which treatment unit in turn includes at least an assembly for



displaying the stored information, as assembly for detecting the coordinates of portions of the displayed information and an assembly for the manual input of data processing commands; and an output unit connected to said data processing machine and including a printing form production machine.

4,007,363

ELECTRIC CONTROL DEVICE USING FREQUENCY-ANALOG CONTROL

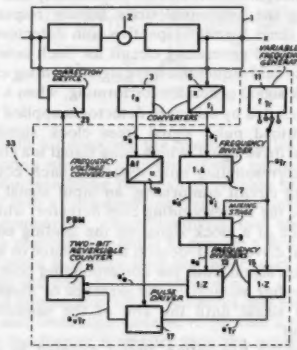
Jürgen Lemmrich, Hamburg, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 10, 1975, Ser. No. 540,175

Claims priority, application Germany, Jan. 30, 1974, 2404255

Int. Cl.² G05B *11/26*

U.S. Cl. 235—151.1 **25 Claims**



1. An electrical control device for deriving a correction signal from a frequency-analog actual-value signal and a frequency-analog desired-value signal comprising, a subtractor stage, means for applying to the subtractor stage a frequency-analog actual-value signal and a desired-value signal, said subtractor stage producing at its output a differential pulse train of a frequency which equals the difference between the frequencies of the actual-value signal and the desired-value signal, an adder stage, a source of carrier pulses, means for applying the differential pulse train and the carrier pulse train to the adder stage which adds the differential pulse train to the carrier pulse train and produces an output pulse train having a frequency which is equal to the sum of the frequencies of the differential and carrier pulse trains, a 2-bit reversible counter

having a counting input for the forward counting direction and a counting input for the reverse counting direction and with overflow inhibition, means for applying the output train to the counting input for one counting direction and the carrier pulse train to the counting input for the other counting direction, and means for taking the output of the second stage of the counter which supplies a control signal in pulse-width modulated form for the formation of the correction signal.

4,007,364

WRITING INSTRUMENT WITH CALCULATOR

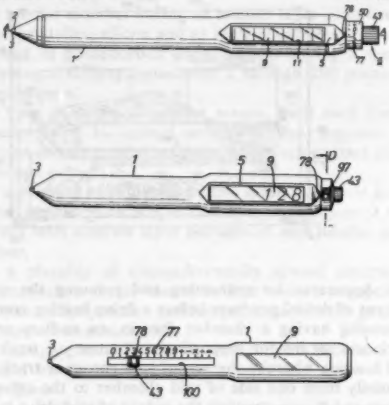
Shin Ojima; Kazuhiko Ohgami; Kazutaka Watanabe; Tohru Yoshimura; Masaya Katou, and Nozomu Matsuoka, all of Yao, Japan, assignors to Hoshidenki-Seizo Kabushiki Kaisha, Osaka, Japan

Filed Apr. 28, 1975, Ser. No. 572,561

Claims priority, application Japan, May 2, 1974, 49-50998[U]; June 6, 1974, 49-65626[U]; July 8, 1974, 49-80499[U]

Int. Cl.² G06F *3/02*

U.S. Cl. 235—152 **10 Claims**



1. A writing instrument provided with a miniature electronic calculator, comprising:

an elongated case;

a pen member housed in said case adjacent one end thereof:

an input structure mounted in said case for selectively generating information in the form of an electrical signal;

an arithmetic unit housed in said case and comprising means responsive to said information from said input structure to perform an arithmetic operation;

display means coupled to said arithmetic unit and visible from the exterior of said case for displaying the result of said arithmetic operation; and

a power source housed in said case for energizing said arithmetic unit and said display means;

said input structure including:

a key manually manipulable from the exterior of said case at the end of said case opposite to said pen member, said key being mounted for rotation about an axis parallel to the longitudinal axis of said case, and said key also being movable along its said axis of rotation

said key including a shank extending along said axis of rotation;

an operator mounted on the shank of said key and extending in the radial direction thereof, whereby rotation of said key causes said operator to move along a circular path;

switching means comprising a plurality of switches disposed about the shank of said key in opposing relationship to the circular path of movement of said operator, different ones of said plurality of switches being selectively brought into alignment with said operator in accordance with the rotational angular position of said key whereby subsequent movement of said key along its axis of rotation controls a selected one of said switches to input information corresponding to said selected one of said switches into said arithmetic unit;

means for biasing said key in a direction away from said switches;

said key input structure including information indicating means having indicia indicative of the information which is to be inputted by said plurality of switches, said indicia being positioned in corresponding relation to the respective rotational angular positions of said key.

4,007,365

LIGHTING FIXTURE WITH TILTABLE REFLECTOR ELEMENTS

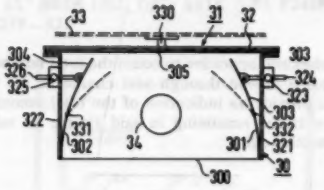
Hans Stempfle, and Werner Rothe, both of Traunreut, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Apr. 9, 1975, Ser. No. 566,316

Claims priority, application Germany, Apr. 10, 1974, 2417605

Int. Cl.² F21V *7/00*

U.S. Cl. 240—41.35 F **10 Claims**



1. In a wide beam lighting fixture having a reflector arrangement in which two opposed bowl shaped lateral reflectors bounding the dowardly directed light egress opening and enclosing a horizontally arranged lamp between them are fixedly mounted on a support with an angle of inclination which can be changed relative to the plane of light egress opening, the improvement comprising means for permitting adjustment of the light distribution curve including an additional reflector element above each lateral reflector supported so that it can be controllably tilted toward the stationary lamp.

4,007,366

RADIOACTIVE TRACER PROFILING SYSTEM AND APPARATUS

Ralph Wiley, Tulsa, Okla., and Charley L. Veach, Alvord, Tex., assignors to The Western Company of North America, Fort Worth, Tex.

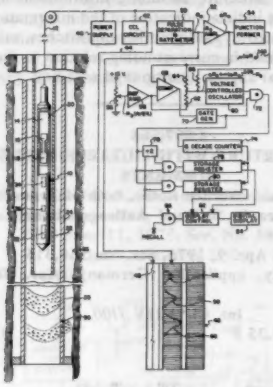
Filed Nov. 21, 1975, Ser. No. 634,241

Int. Cl.³ G01V *5/00*

U.S. Cl. 250—260 **22 Claims**

1. In a system for obtaining the radioactive tracer profile of a borehole, the combination of, a subsurface unit, a cable connected to said unit for moving the same through the borehole, means in said unit for injecting a charge of material into the borehole which contains a radioactive tracer element, radiation detector means in said unit responsive to the radioactive tracer of said charge and arranged to develop a stream of pulses at a rate corresponding to the intensity of said tracer as said detector is moved through said charge, said detector having a predetermined dead time, means for transmitting said stream of pulses to the surface, linear counting rate meter means for developing a first analog signal having an amplitude proportional to the counting rate of said pulse stream at any given instant, means controlled by said first analog signal for generating a second analog signal which is corrected for said

dead time of said detector means, a voltage controlled oscillator having an input to which said second analog voltage is supplied and operative to develop control pulses at a frequency which is proportional to the amplitude of said second analog signal, and pulse counter means controlled by said



control pulses and operative to count the total number thereof as said unit is moved through said charge in the borehole, thereby to provide an indication of the total amount of said radioactive tracer remaining in said charge as said unit is moved therethrough.

4,007,367

SEMEN THAW SYSTEM

Robert K. Rusteberg, R.R. 2, P.O. Box 153 Algonquin Road, Barrington Hills, Ill. 60010, and Robert J. Froehlich, 210 S. Louis, Mount Prospect, Ill. 60056

Filed Feb. 2, 1976, Ser. No. 654,539
Int. Cl.² F27D *11/00*
U.S. Cl. 219—385 **3 Claims**

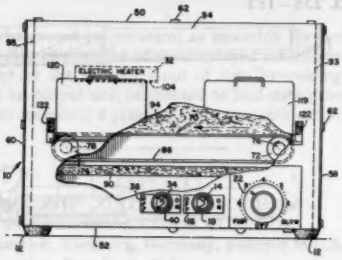
1. A system connectable to a source of electrical power for controllably thawing frozen semen contained in semen straws for use in artificial insemination of animals comprising, in combination, a first casing having a container for receiving the straws of frozen semen, electrical heating means for said container and connectable to said source for controllably heating the containers from a first temperature to an elevated temperature for causing the semen to pass from its crystalline to a liquid state in a preselected time of relatively few seconds, presettable electronic timer means for timing the heating period, electrical switch means having first and second operating positions, said switch means being operable to its first position to electrically connect the heating means to the source, said switch means in its first position concurrently causing the electronic timer means to be activated, indicating means operable in response to said electrical timer means for indicating the completion of the preset heating time period, and said switch means being selectively operable to its second position to electrically disconnect the heating means from the source, whereby the semen may be controllably heated through the critical transition stage from its crystalline to its liquid state within a preselected time to thereby retain maximum cell yield by minimizing loss of semen activity.

4,007,368

HEATING APPARATUS

Robert A. Jensen, Hazel Crest; John A. Tesk, Woodridge, and Daniel Odulio, Chicago, all of Ill., assignors to Howmedica, Inc.

Filed Jan. 10, 1975, Ser. No. 540,178
Int. Cl.² F27B *9/06*
U.S. Cl. 219—388 **4 Claims**

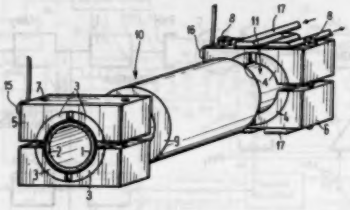


1. Apparatus for preheating and reducing the moisture content of dental products before a firing heating comprising a housing having a chamber therein, an endless conveyor track and means for supporting said conveyor track within said housing whereby the run of said conveyor track is substantially from one side of said chamber to the other, drive means and means coupling the output of said drive means to said conveyor track support means for moving said dental products on said conveyor track from said one side of said chamber to said other side, door means in said housing providing access to said chamber within the region adjacent said sides whereby dental products may be located on said conveyor track at said one side of said chamber and removed from said conveyor track at said other side of said chamber, insulating means for said chamber, said insulating means including an insulating layer below said conveyor track dividing said chamber into a heating and a control portion, heating means disposed within said heating portion of said chamber, said heating means having a heat emanating surface within the region of said chamber other side throughout at least a major portion of the width and along a portion of the length of said endless conveyor track, control means supported within said control portion of said chamber, said control means comprising means for connection to an electrical power source and circuit means including said drive means and electrical heating means in parallel connection across said connection means and power source, said circuit means including a first switch means for providing primary control of said drive and heating means, second switch means in said circuit secondarily controlling said drive means; and means within said chamber at said other side for physically impeding forward movement of said dental products as said conveyor track is driven by said drive means, said impeding means being movable slightly upon contact of said dental products whereby said impeding means is adapted to activate a switch which enables operation of an alarm whereby an operator will be advised that said dental products have been conveyed to said other side of said chamber.

4,007,369
TUBULAR OVEN

Wolfgang Dietze, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Apr. 13, 1976, Ser. No. 676,618
Claims priority, application Germany, Apr. 23, 1975, 2518045; June 23, 1975, 2527927
Int. Cl.² F27D 11/02
U.S. Cl. 219—390 5 Claims



1. An oven comprising

A. a tubular member having an interior layer comprised of polycrystalline silicon and an integral exterior layer comprised of phosphorous doped silicon having a specific resistance ranging from about 2 through 200 microohm centimeters,

B. a pair of electrical contact means, each such contact means being in contact with a different opposed end region of said tubular member, each such contact means having

1. a plurality of circumferentially spaced adjacent graphite support members in face-to-face engagement radially with exterior layer portions of said tubular member,

2. a plurality of circumferentially spaced electrically conductive metal blocks in face-to-face engagement with radially outer surface portions of said graphite support members, and

3. clamping means securing said support members and said blocks together at and about said opposed end regions

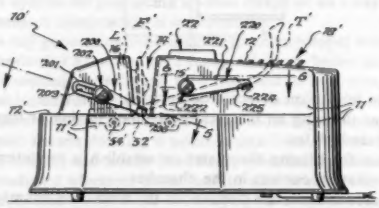
C. a thermally insulative layer circumferentially extending around said tubular member between said pair of electrical contact means but in axially spaced, adjacent relationship thereto, and

D. means for cooling said pair of electrical contact means, said means for cooling comprising tubing adapted for conveying a cooling fluid in heat-exchange relationship to said metal blocks.

4,007,370
DEVICE FOR HEATING THERMOPLASTIC EYEGLASS FRAMES

Edward A. Ebert, 203 Huxley Drive, Snyder, N.Y. 14226

Filed June 3, 1974, Ser. No. 475,651
Int. Cl.² H05B 3/06
U.S. Cl. 219—521 11 Claims

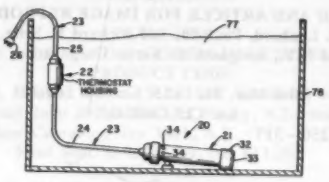


1. A radiant type heater for heating an opthalmic frame having a frontal lens holding portion and a temple portion comprising a housing, electrical heating means and heat transfer means for transferring heat to first and second opposed heat radiating surfaces on said housing for receiving said frontal lens holding portion therebetween support means on said housing to hold said frontal lens holding portion of said opthalmic frame between said first and second heat radiating surfaces and in spaced relation thereto, said first heat radiating surface having opposite extreme outer ends with at least one extreme outer end being of a configuration to extend radiation beyond said one extreme outer end to meet radiation from said second heat radiating surface, said first heat radiating surface being of a dimension to permit said temple portions to be placed outside of said extreme outer ends of said first heat radiating surface and to also permit a portion of said frontal lens holding portion to be placed outside of said one extreme outer end of said first heat radiating surface, whereby said one extreme outer end will heat said portion of said frontal lens holding portion which extends beyond said one extreme outer end of said first radiating surface.

4,007,371
ELECTRIC IMMERSION HEATER FOR STOCK TANKS

Lester B. Njos, and Gordon L. Lamb, both of Rhame, N. Dak. 58651

Continuation of Ser. No. 385,109, Aug. 2, 1973, abandoned.
This application Dec. 3, 1974, Ser. No. 529,044
Int. Cl.² H05B 1/02, 3/80; A01K 7/00; F24H 1/22
U.S. Cl. 219—523 1 Claim



1. A tank heater device comprising a heating cylinder means, said heating cylinder means comprising an elongated hollow cylinder adapted to be placed immersed in the bottom of a water tank, means for supporting said cylinder on the floor of said tank at a small acute angle with one end slightly higher than horizontal to the other end, said heating cylinder means having an electric heating element inside of said cylinder, said upper end of said cylinder having radially directed outlet hole means directing the water from within the cylinder out of the cylinder and back into the water in the tank in at least three different directions, which directions are laterally outward from the longitudinal axis of the cylinder at approximately 90° intervals to one another, sid upper end of said cylinder having closure means to cause the water within the upper end of the cylinder to be directed out through the radially directed water outlet hole means, said lower end of said cylinder having water inlet hole means, said water inlet hole means and said water outlet hole means communicating directly with the water in the tank with said cylinder imperforate between said inlet and outlet hole means, wherein water in the tank may travel into the water inlet hole means at the lower end of the cylinder past the heating element to be heated by said element and travel out of said cylinder through the radially directed water outlet hole means after being heated in different directions radially, at least a three wire electric waterproof cord having a pair of current wires connected to the heating element and extending to the surface to energize the heating element, a thermostatic switch along and in the path of said electric cord spaced away from said heating cylinder and near the surfce of the water in the tank, and connected to at least one of said current wires of said electric cord to control the energization of the heating element, said electric cord also including a ground wire, said heating cylinder means having metallic portions, said ground wire being

connected to said metallic portions at its one end and adapted to be connected to a ground at its other end to provide a ground for said heating cylinder means, said thermostatic switch and said at least one current wire where connected to said thermostatic switch being closed in a waterproof enclosure so as to be submersible in the water in the tank, said elongated cylinder having a wall adjacent one end of said cylinder dividing said cylinder into a small chamber and a relatively large main chamber, with said water inlet means and outlet means being located in said main chamber, a detachable cap means covering said one end of said cylinder, said wall having an opening, said heating element having an elongated heating rod with electrical connections to said heating rod being mounted in a plug at one end of said rod, said rod of said heating element projecting into said main chamber through said wall opening with said plug attached to said wall to form a watertight seal in the wall and with said electrical connections for said rod being located in said small chamber, said detachable cap means covering said one end of said cylinder to cover said electrical connections in said small chamber in watertight relation, said cap having an opening therethrough with said cord passing through said opening for electrical connections of its wires to said electrical connections of said heating element, means providing a watertight seal between said cord and said detachable cap means in the opening into said cap.

4,007,372

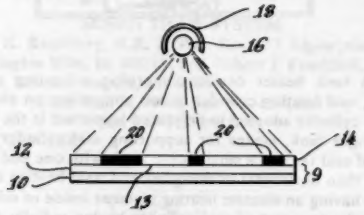
METHOD AND ARTICLE FOR IMAGE REPRODUCTION

Myron J. Lenhard, Penfield, and Richard F. Selig, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 26, 1975, Ser. No. 562,321

Int. Cl.[2] G03C *5/16*

U.S. Cl. 250—317 **24 Claims**



1. A reproduction master comprising:

an image transfer body having a surface thereof which is adapted to be tackified in image configuration; and,

a developer material adhering to said tackified surface, said developer comprising heat absorbent developer bodies, a sublimable dye coated on a surface of said heat absorbent developer bodies whereby heating of said dye causes sublimation of said dye.

4,007,373

RADIOGRAPHIC APPARATUS

Roger Torguet, and Michel Frechede, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Sept. 23, 1975, Ser. No. 616,010

Claims priority, application France, Sept. 27, 1974, 74.32653

Int. Cl.[2] A61B *6/00;* **H05G** *1/46*

U.S. Cl. 250—355 **6 Claims**

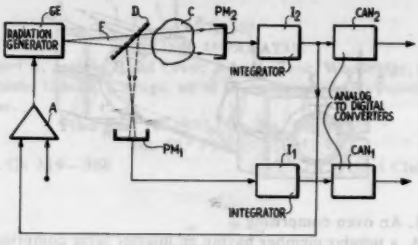
1. A radiographic observation apparatus comprising:

an X-ray beam generating source for producing an X-ray beam for irradiating a predetermined portion of a body, and having an input for varying the energy of said beam as a function of an applied electrical signal;

first electrical transducer means for receiving said beam after passage through said body and producing at an output an electrical signal which varies as a function thereof;

means disposed over the beam trajectory for receiving said beam prior to passage through said body and for scattering a predetermined fraction of said beam energy;

second electrical transducer means for receiving said scattered energy fraction and producing at an output an electrical signal which varies as a function thereof;



means defining a feedback loop connected between said first transducer means output and said source input for applying said signal at the output of said first transducer means to said input;

means for transducing into first and second sets of digital data the electrical signals respectively produced by said first and second transducer means, said first set of data indicating the absorption coefficient of said body, and of said radiation energy and said second set of data indicating the radiated energy.

4,007,374

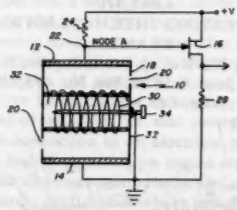
IONIZATION DETECTOR WITH IMPROVED RADIATION SOURCE

Elias F. Solomon, Duxbury, Mass., assignor to Gulf & Western Manufacturing Company (Systems), New York, N.Y.

Continuation-in-part of Ser. No. 593,704, July 7, 1975. This application Sept. 11, 1975, Ser. No. 612,350

Int. Cl.[2] G01T *1/18*

U.S. Cl. 250—384 **13 Claims**



1. An ionization detector comprising:

means defining an ionization chamber having at least two spaced plates,

means for biasing the plates to establish a predetermined ionization current in the chamber,

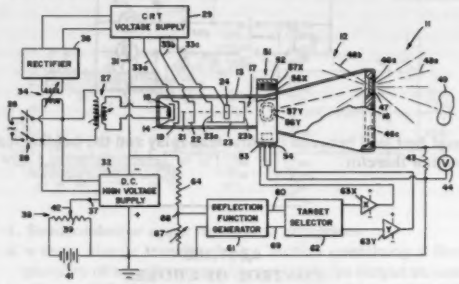
a source of radiation disposed in the ionization chamber and being in the form of a wound ribbon means extending over an area of the chamber,

and means supporting the source of radiation including a core about which the ribbon means is wound.

4,007,375
MULTI-TARGET X-RAY SOURCE

Richard D. Albert, 317 Hartford Road, Danville, Calif. 94526

Filed July 14, 1975, Ser. No. 595,388
The portion of the term of this patent subsequent to Dec. 9, 1992, has been disclaimed.
Int. Cl.² G01J 1/00; G01N 23/20; G21K 1/00; H05G 1/30
U.S. Cl. 250—404 17 Claims



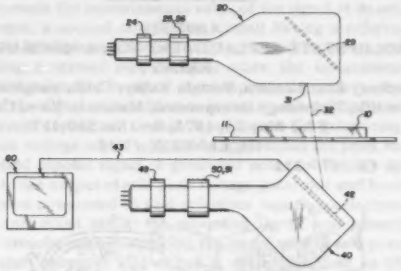
1. A multi-target X-ray source comprising:
an evacuated envelope,
anode means within said envelope supporting a plurality of spaced-apart targets for producing X-rays in response to electron bombardment of any selected one of said targets,
an electron gun disposed within said envelope and spaced apart from said targets, said electron gun having an electron emissive cathode and means for forming an electron beam,
a high-voltage supply having a positive terminal connected to said anode means and a negative terminal connected to said electron gun to establish a voltage difference between said cathode and said anode means for accelerating said electron beam,
deflector means for deflecting said electron beam in response to deflection signals,
a target selector having means coupled to said deflector means for transmitting any selected one of a plurality of different target selection deflection signals thereto to direct said electron beam to any selected one of said targets, and
a beam position stabilizing circuit responsive to variations of said voltage difference and having means for increasing said target selection deflection signals in response to increases of said accelerating voltage and for decreasing said target selection deflection signals in response to decreases of said accelerating voltage.

4,007,376
VIDEO X-RAY IMAGING SYSTEM AND METHOD

Samuel Morton Zimmerman, 3530 Forest Lane, Suite 98, Dallas, Tex. 75234

Filed Aug. 7, 1975, Ser. No. 602,811
Int. Cl.² H05G 1/30
U.S. Cl. 250—416 TV 17 Claims

1. A system for producing a video image of an x-ray irradiated subject comprising, in combination
an x-ray generating tube including: an envelope; means for producing a focused high energy electron beam; an anode presenting an enlarged face disposed to be impinged by said electron beam; means for deflecting said electron beam to sweep said anode face, producing a moving focal spot; means defining a point-source window in said tube envelope; said anode face being oriented, relative to the produced electron beam and to said window, to direct generated x-rays from the moving focal spot to said window, thereby radiating a narrow sweeping beam of x-rays from said window;
a pickup tube, for detecting x-radiation, including: a face plate having a mosaic of x-ray sensitive globules responsive to x-radiation to produce an electric image corresponding to the density of x-rays passing through an irradiated subject; means for producing a focused electron beam directed to said face plate; means for deflecting said electron beam to sweep said face plate;

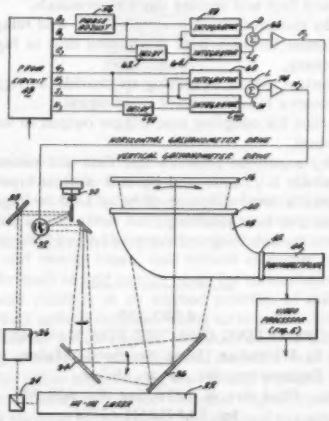


circuit means including means for synchronizing the sweep of the pickup tube electron beam with the sweep of the x-ray generating tube electron beam, and therefore with the sweep of said x-ray beam, whereby said pickup tube produces a video output signal for feeding to a video monitor to produce an x-ray picture.

4,007,377
OPTICAL SCANNING SYSTEM FOR UNIVERSAL PRODUCT CODE

Donald R. Simon, Wayne, N.J.; Anil Vasudeva, San Jose, Calif., and John J. Zukatus, Jr., Nutley, N.J., assignors to The Singer Company, New York, N.Y.

Filed Sept. 8, 1975, Ser. No. 611,362
Int. Cl.² G06K 7/10
U.S. Cl. 250—566 9 Claims



1. An optical scanner comprising:
means for generating a pencil of substantially monochromatic light;
first means interposed in the path of said pencil for selectively deflecting said pencil in a first plane;
second means interposed in the deflected path of said pencil for selectively deflecting said pencil in a second plane at right angles to said first plane; and for projecting said deflected pencil to a scan window;
reading means positioned to detect the light reflected from an object at said scan window; and
circuit means coupled to said first and said second means

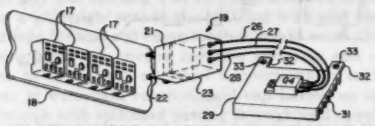
for controlling the amplitude and deflection rates thereof, said circuit means including circuitry for producing deflection drive signals having linear slopes with horizontal portions at each slope reversal to enable the deflecting means to follow said deflection drive signals.

4,007,378

SOLID STATE REPLACEMENT FOR A MECHANICAL RELAY

Anthony Ross Lazzara, Portola Valley, Calif., assignor to Scientific Technology Incorporated, Mountain View, Calif.

Filed May 23, 1975, Ser. No. 580,417
Int. Cl.² H03K *19/12*
U.S. Cl. 307—112 **10 Claims**



1. A mechanical relay replacement for insertion into a mechanical relay receptacle in which is provided a predetermined socket pattern comprising

a relay base,

a plurality of electrical base pins formed to fit the sockets and mounted on a first side of said relay base and having a pin pattern matching the socket pattern,

a control circuit for receiving a control input signal, said control circuit being mounted on a second side of said relay base and connected to said base pins,

an enclosure attached to said relay base enclosing said control circuit,

a heat sink for remote mounting from said relay base and receptacle,

means for switching a high current level mounted on said heat sink, said last named means having a control terminal and first and second current terminals,

whereby standard size is maintained for said relay base and enclosure for high heat dissipation due to high current switching,

said control circuit operating to provide a trigger output responsive to said control input signal,

and means for coupling said trigger output to said control terminal,

whereby a current between said first and second current terminals is commanded by said control input signal to assume a level determined by a load voltage therebetween and heat resulting from said current through said means for switching is dissipated remotely from said relay base.

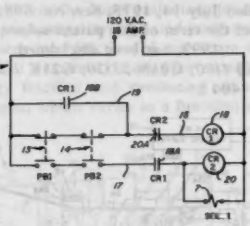
4,007,379

OPERATING CURCUIT FOR MACHINES

Thomas F. Whittaker, West Scarboro, Maine, assignor to Safety Engineering, Inc., Gray, Maine

Filed Nov. 6, 1975, Ser. No. 629,507
Int. Cl.² H01H *47/04*
U.S. Cl. 307—115 **2 Claims**

1. A circuit for apparatus including an element having a reciprocable work stroke relative to a work support and an electrically operated device in control of the work stroke, said circuit including first and second parallel leads, two switches, one for each hand of the operator and both in control of both leads and both normally closed with respect to the first lead, and means rendering the circuit inoperative after a work stroke until both switches are again in their normally closed positions, said second lead including said device, said means including a relay in the first lead, a holding lead for said relay bypassing said first lead switches, said relay including two normally open switches, one in the holding lead and one in the second lead, and said second lead including a relay in parallel with said device and provided with a normally closed switch in said first lead between the first lead relay and the holding lead switch therefor.

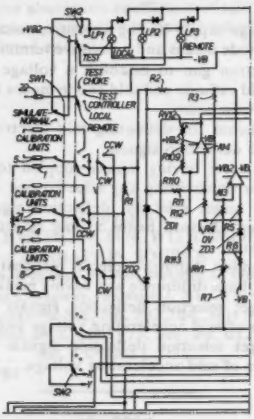


4,007,380

CONTROL OF CHOKES

Garry Thurgood, Bagshot, England, assignor to The British Petroleum Company Limited, London, England

Filed Apr. 25, 1975, Ser. No. 571,696
Claims priority, application United Kingdom, Apr. 29, 1974, 18663/74
Int. Cl.² G08B *21/00*
U.S. Cl. 307—149 **8 Claims**



1. A well choke control apparatus comprising:

a. means for producing a first electrical signal indicative of a required position of the choke;

b. means for deriving a second electrical signal indicative of the actual position of the choke;

c. first comparator means, the first comparator means being arranged to be fed with said first and second electrical signals and to control actuation of the choke in the required direction to equalize said electrical signals;

d. second comparator means;

e. means settable to produce a third electrical signal indicative of a predetermined closed position of the choke; and

f. override control means;

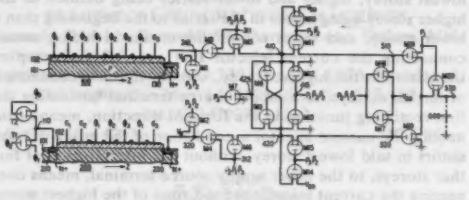
the second electrical signal indicative of the actual position of the choke is also arranged to be fed as one input to the second comparator means, a further input of which is connected to the means settable to produce the third electrical signal, the output of the second comparator means being connected to said override control means which is arranged to prevent further actuation of the choke when said second and third signals are equal.

4,007,381

BALANCED REGENERATIVE CHARGE DETECTION CIRCUIT FOR SEMICONDUCTOR CHARGE TRANSFER DEVICES

Amr Mohamed Mohsen, North Plainfield, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 18, 1975, Ser. No. 569,581
Int. Cl.² H03K 5/20, 3/353; G11C 19/28; H01L 27/10
U.S. Cl. 307—235 F 8 Claims



1. Semiconductor apparatus which comprises

a. a main charge transfer device section containing a first plurality of transfer stages for providing an output stream of essentially binary level charge packet bits, each such charge packet arriving at a first output terminal of said main charge transfer device section;

b. an auxiliary charge transfer device section, containing a second plurality of tranfer stages that is substantially less than the first plurality, for providing an output stream of unilevel charge packet bits to a second output terminal, each and every said unilevel charge packet being substantially midway in charge level between the output levels of the binary charge packet bits;

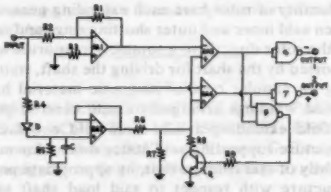
c. amplifying means coupled to receive outputs from the first and second output terminals for delivering to a third output terminal a signal stream characterized in that said stream is at a first level corresponding to a charge packet arriving at the first terminal greater than the charge packet arriving simultaneously at the second terminal and is at a second level corresponding to a charge packet arriving at the first terminal less than the charge packet arriving simultaneously at the second terminal; said amplifying means including a flip-flop amplifier fed by a pair of preamplifiers, each said preamplifier having a first insulated gate field effect transistor whose gate electrode is connected to a different one of the first and second output terminals of the said charge transfer device sections.

4,007,382

BIPOLAR SIGNAL PROCESSING CIRCUIT

John Martin Warberg, Oakville, Canada, assignor to Canadian National Railway Company, Montreal, Canada

Filed June 27, 1975, Ser. No. 590,828
Claims priority, application Canada, Feb. 12, 1975, 219887
Int. Cl.² H03K 5/20
U.S. Cl. 307—236 5 Claims



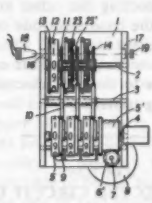
1. A bipolar signal processing circuit for recovering and processing a bipolar signal that could be degraded and for separately representing the positive and the negative portions of said bipolar signal, comprising: input means for receiving a bipolar signal, an inverter circuit coupled to said input means for inverting the bipolar signal, a first comparator circuit having a reference input and having a signal input coupled to the output of said inverter circuit for producing a first output signal when the instantaneous value of the signal at its signal input exceeds the instantaneous value of the signal at its reference input, a second comparator circuit having a reference input and having a signal input coupled to said input means for producing a second output signal when the instantaneous value of the signal at its signal input exceeds the instantaneous value of the signal at its reference input, a peak voltage generator circuit connected to said input means for producing a reference voltage whose amplitude approaches the peak voltage of said bipolar signal, a grounded potential divider connected to the output of said peak voltage generator and having its junction connected to said reference inputs, an electronic switch connected across the grounded leg of said potential divider for substantially reducing the impedance of said potential divider whenever said switch is conductive, and an OR-gate circuit connected to said switch for maintaining said switch conductive during the presence of one of said first and second output signals, whereby said first output signal represents one of said positive and said negative portions of said bipolar signal and whereas said second output signal represents the other one of said portions of said bipolar signal.

4,007,383

POSITION DETERMINING DEVICE

Harald Wessner, Neunkirchen, Austria, assignor to Karl Vockenhuber and Raimund Hauser, both of Vienna, Austria

Filed Jan. 26, 1976, Ser. No. 652,045
Claims priority, application Austria, Jan. 27, 1975, 566/75
Int. Cl.² H01J 3/14
U.S. Cl. 250—237 G 4 Claims



1. A position determining device comprising, in combination, at least one pair of objects arranged for relative movement in a pre-set counter train, an optical element on each of said objects, a transmitter for generating an energy beam and for directing said beam in a predetermined path, a receiver for receiving said energy beam, said optical elements being disposed in the path of said energy beam for transmission of said beam to said receiver in an aligned position of said optical elements, said optical elements being arranged to deflect said energy beam in a non-aligned position, one of the objects comprising a rotatably mounted dial movable into a pre-set position, the other object being movable to position the optical element on said other object into said aligned position with the optical element on said one object in said pre-set position for transmission of said energy beam in said predetermined path to said receiver.

4,007,384

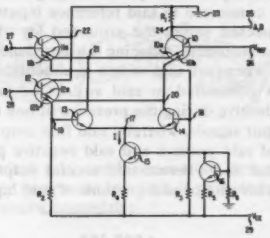
NONINVERTING CURRENT-MODE LOGIC GATE

Richard Donald Brooks, Emmaus, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 8, 1975, Ser. No. 638,816
Int. Cl.² H03K 17/00
U.S. Cl. 307—218 3 Claims

1. A noninverting current-mode logic AND gate comprising,

1. a pair of input terminals,
2. an output terminal,
3. a source of substantially constant current, including a supply terminal adapted for connection to a source of voltage,
4. a pair of differentially-connected, emitter-coupled, current steering transistors connected to said current source,
5. a first input transistor having its base connected to one of said input terminals,
6. a second input transistor having its base connected to the other input terminal,
7. said input transistors having dual emitters,
8. a reference transistor having its collector connected to said output terminal and having dual emitters,



9. first means connecting one emitter of said first input transistor to one emitter of said reference transistor and to the collector of one of said current steering transistors,
10. second means connecting one emitter of said second input transistor to the other emitter of said reference transistor and the other collector of the other of said current steering transistors,
11. third means connecting the other emitter of said first input transistor to the base electrode of the other of said current steering transistors, and
12. fourth means connecting the other emitter of said second input transistor to the base electrode of said one of the current steering transistors.

4,007,385

SERIALLY-CONNECTED CIRCUIT GROUPS FOR INTERGRATED INJECTION LOGIC

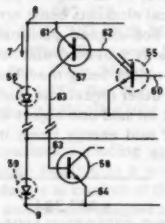
Claude Chapron, Caen, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 11, 1974, Ser. No. 504,911

Claims priority, application France, Sept. 13, 1973, 73.32916

Int. Cl.² H03K *19/08*; H01L *27/02*, *27/04*

U.S. Cl. 307—296 **7 Claims**



1. An integrated injection logic circuit comprising controlling and controlled transistors having bases and collectors and connected to at least some of said transistors to bias same associated biasing current injectors each having at least first, second and third zones with the first and second zones forming a first rectifying junction and the second and third zones forming a second rectifying junction, means connecting the controlling transistor collectors to the controlled transistor bases, the transistors and associated current injectors forming plural elementary groups which require substantially the same supply current and each with a current injector, two terminals for connection to a current supply source, means connecting the plural groups in series across the two terminals for the current supply source so as to include a first in the series defined as the highest storey, a last in the series defined as the lowest storey, higher and lower stories being defined as the higher storey being closer in the series to the beginning than a lower storey, said series connecting means including means connecting the current injector first zone of the group of transistors in the highest storey, without the interconnection of further storeys, to a supply source terminal for biasing the first rectifying junction in the forward direction, means connecting the current injector second zone of the group of transistors in said lowest storey, without the interposition of further storeys, to the other supply source terminal, means connecting the current injector second zone of the highest storey to the current injector first zone of the next lower storey, and means providing a signal connection between a controlling transistor collector of a higher storey and a controlled transistor base of a lower storey, said means providing said signal connection including an auxiliary transistor having emitter, base and collector, means connecting the auxiliary transistor collector to the controlled transistor base, means connecting the auxiliary transistor emitter to the current injector first zone of said higher storey, and means connecting the auxiliary transistor base to the controlling transistor collector.

4,007,386

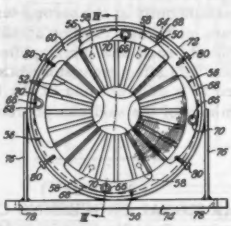
ELECTRIC INDUCTION DRIVE ASSEMBLIES

Romuald Zdzislaw Rustecki, 99 Chertsey Lane, Staines, Middlesex, England

Continuation of Ser. No. 425,738, Dec. 18, 1973, abandoned. This application May 16, 1975, Ser. No. 578,095

Int. Cl.² H02K *15/14*

U.S. Cl. 310—42 **10 Claims**



1. An electric induction drive assembly for driving a rotatably supported load shaft as distinguished from a self contained independent motor comprising a rotor including an annular core of magnetic material having an end face, radially inner and outer shorting rings between which said core extends, a plurality of rotor bars each extending generally radially between said inner and outer shorting rings and means for mounting the rotor directly to a rotatably supported load shaft to be supported by the shaft for driving the shaft, stator means comprising an annular core of magnetic material having an end face and windings arranged on said core to produce a magnetic field extending axially from said end face of the core, a structure supporting said stator means for movement independently of said rotor so that, by appropriate positioning of the structure with respect to said load shaft said drive assembly may be made operable to drive said load shaft with the stator core having said end face thereof confronting said end face of said rotor core, said stator means and said support structure, on the one hand, and said rotor, on the other hand, being entirely discreet components having no direct mechani-

cal connections therebetween, and said stator support structure having means fixedly securing the stator means to the support structure and means defining an opening within the suppport structure of sufficient size to permit the stator means to be removed from and replaced on said support structure when the assembly is arranged in the operable condition, without movement of the support structure.

4,007,387

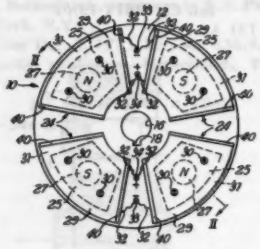
ELECTRICAL SYNCHRONOUS MACHINES

Romuald Zdzislaw Rustecki, 99 Chertsey Lane, Staines, Middlesex, England

Continuation of Ser. No. 425,739, Dec. 18, 1973, abandoned. This application May 14, 1975, Ser. No. 577,450

Int. Cl.² H02K *15/00*

U.S. Cl. 310—42 **12 Claims**



1. An electrical synchronous machine comprising a rotor having a plurality of field coils of alternating polarities arranged on core elements of magnetic material and disposed around the axis of rotation of the rotor to produce a magnetic field extending away from the core elements and axially of the rotor; means mounting said rotor to a shaft of a device independent of the machine; a stator having a plurality of windings arranged on an annular core of a magnetic material and disposed around an axis of the stator so that parts of the windings lie adjacent a surface of the core; and a structure supporting said stator; said rotor, on the one hand, and the combination of said stator and support structure, on the other hand, being constructed as entirely discrete elements whereby said machine may be made operable by positioning said support structure with respect to the rotor mounted on said shaft so that the rotor and the stator core are substantially coaxial and so that the rotor core elements confront said surface of the stator core, the core elements for the field coils comprise like, individual pole yokes for each coil, further comprising a substantially circular and plate-like support member and means securing the yokes each at one end to a surface of said support member, which surface is normal to the axis of rotation of the rotor, the yokes extending axially away from the support surface and being equally spaced around the axis of rotation, the core elements further comprise a plurality of flat pole shoes, a respective, pole shoe being secured to the other end of each pole yoke, the surfaces of the shoes remote from the support member lying in a common plane normal to the axis of rotation of the rotor.

4,007,388

DYNAMOELECTRIC MACHINE LOAD PACKAGE HAVING AN ACOUSTICALLY ISOLATED ENCLOSURE

John F. Lawyer, Albany, N.Y., and Vincent G. Terry, Beverly, Mass., assignors to General Electric Company, Schenectady, N.Y.

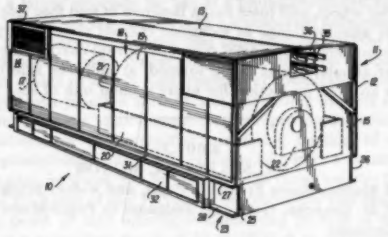
Filed June 19, 1975, Ser. No. 588,514

Int. Cl.² H02K *5/24*

U.S. Cl. 310—51 **6 Claims**

1. A dynamoelectric machine load package including an acoustically isolated enclosure, said load package comprising:

a. a load package base, said load package base further comprising:
   i. a base plate, and
   ii. I-beams for supporting said base plate, said I-beams positioned around the periphery of said base plate and having upper and lower I-beam rails,
b. a dynamoelectric machine including a stator and a frame for said stator;
c. a plurality of resilient isolation pads for resiliently supporting said stator frame on said upper I-beam rails;
d. a reduction gear for driving said rotor, said reduction gear firmly mounted in vibration-transmitting relationship to said base plate;
e. bearing pedestals for supporting a rotor shaft of said dynamoelectric machine, said pedestals firmly mounted in vibration-transmitting relationship to said base plate;
f. an enclosure, said enclosure further comprising:
   i. an enclosure side rail along each side of said enclosure,
   ii. an upper main part having a top, two sides and an end, said upper main part firmly attached to said enclosure side rail, and
   iii. lower base skirt panels firmly attached to and extending downwardly from said enclosure side rails so as to form a lower extension of sides of said upper main part;



g. a first plurality of isolation mounts each arranged between one of said enclosure side rails and a corresponding one of said upper I-beam rails to support said enclosure side rail on said load package base;
h. a second plurality of isolation mounts each arranged between a lower edge of one of said base skirt panels and a corresponding one of said lower I-beam rails;
i. resilient seals between each enclosure side rail and a corresponding one of said upper I-beam rails to permit relative movement of the enclosure and said load package base while preventing air flow and transmission of air-borne noise between an upper main generator cavity and a lower base skirt cavity; and,
j. resilient seals between the lower edges of said base skirt panels and the corresponding lower I-beam rails to permit relative movement of said enclosure and said base while preventing air flow and transmission of air-borne noise between said lower base skirt cavity and the surrounding environment;

whereby air-borne noise and vibration transmitted to the surrounding environment is reduced.

4,007,389

ROTATING RECTIFIER ASSEMBLY FOR ELECTRIC MACHINES

Heinrich Küter, Wattenscheid, Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulherim (Ruhr), Germany

Filed July 10, 1975, Ser. No. 594,750

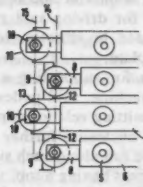
Claims priority, application Germany, July 15, 1974, 2433955

Int. Cl.² H02K *11/00*

U.S. Cl. 310—68 D **4 Claims**

1. In a multiphase bridge circuit for electric machines, a rotating rectifier assembly comprising cooling members, recti-

fier cells and fuses, and including a carrier wheel having a radially outer annular flange extending therefrom, said rectifier cells being radially outwardly braced at the inner side of said annular flange, said cooling members being current-conductive and being interposed between said rectifier cells and said inner side of said annular flange, said cooling members being electrically connected with said rectifier cells and being insulated from said carrier wheel, and said fuses being directly



braced at said annular flange, one of said fuses, respectively, being serially connected with each of said cooling members, said outer annular flange having a free side spaced from said carrier wheel, said fuses being fastened at said free side of said outer annular flange at locations thereof alternatingly offset from one another in axial direction of said carrier wheel, said outer annular flange being formed, at said free side thereof, with an axial projection for every second one of said fuses.

4,007,390

BRUSHLESS D-C MOTOR

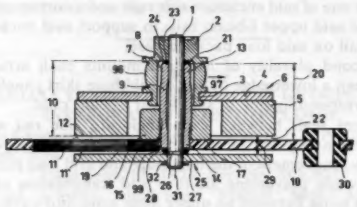
Rolf Muller; Georg Friedrich Papst, and Volker Schlicker, all of St. Georgen, Germany, assignors to Papst-Motoren KG, Germany

Filed July 26, 1974, Ser. No. 492,146

Claims priority, application Luxembourg, July 26, 1973, 68101

Int. Cl.² H02K *5/16*

U.S. Cl. 310—90 **13 Claims**



1. Brushless D-C motor comprising:

rigid flat stator plate,

flat motor coils arranged on said stator plate,

bearing tube, said stator plate being coaxial on said bearing tube,

rotor shaft rotatably supported in said bearing tube by radical bearings at respective ends of said bearing tube,

first and second rotor discs fixed to said rotor shaft at each end of said bearing tube, said first and second rotor discs being spaced to provide an air gap, said stator plate and motor coils extending into said air gap,

at least one hub for rotatably supporting at least one of said first and second rotor discs, said hub including a bearing face for bearing against a first respective end of said bearing tube adjacent said one rotor disc,

an axially magnetized permanent magnet fixed to at least one of said first and second rotor discs, and

means connected at a predetermined axial position on said bearing tube for fixing said stator plate and motor coils to said bearing tube at said axial position within said air gap, said means having a portion secured to said stator plate,

wherein said means for fixing said stator plate and motor coils is a member having axial and radial thicknesses, said member having an aperture for insertion of said member onto said bearing tube, said portion securing said stator plate being a radial surface of said member,

wherein said member is connected to said bearing tube by means of a press fit, and

wherein said stator plate is secured to said radial surface of said member by means of rivets extending through said stator plate and said member in the axial direction.

4,007,391

IGNITERS

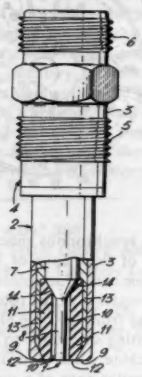
Peter D. Baker, Basingstoke, England, assignor to Smiths Industries Limited, London, England

Filed Nov. 4, 1975, Ser. No. 628,639

Claims priority, application United Kingdom, Nov. 4, 1974, 47661/74

Int. Cl.² H01T *13/02*

U.S. Cl. 313—131 A **12 Claims**



1. In an igniter in which semiconductive material is interposed between two electrodes to provide at the operative tip of the igniter an exposed semiconductive surface across which electrical discharge between the electrodes takes place in operation, the improvement wherein one of the electrodes is separated by a gap from the semiconductive surface, and said one electrode is connected to the semiconductive material at the bottom of the gap away from said tip.

4,007,392

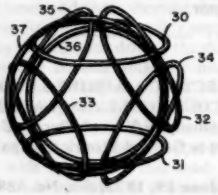
MAGNETIC WELL FOR PLASMA CONFINEMENT

August Valfells, Ames, Iowa, and Ya-Chang Chiu, Madison, Wis., assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Apr. 16, 1974, Ser. No. 461,345

Int. Cl.² H01J *1/50;* **G21B** *1/00*

U.S. Cl. 313—154 **16 Claims**



1. Apparatus for forming a magnetic well for plasma confinement comprising a plurality of at least four current-carry-

ing loops arranged such that each loop lies in a plane corresponding generally to one facet of a substantially regular polyhedron, the magnitude and direction of current flow in said loops being such as to minimize the magnetic field at the center of said polyhedron when all current loops are energized.

4,007,393

BARIUM-ALUMINUM-SCANDATE DISPENSER CATHODE

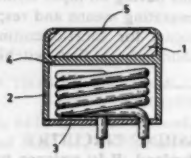
Antonius Johannes Alberta van Stratum; Johannes Gerardus van Os; Johannes Reinier Blatter, and Pieter Zalm, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 2, 1975, Ser. No. 636,931

Claims priority, application Netherlands, Feb. 21, 1975, 7502052

Int. Cl.² H01J *1/14, 19/06*

U.S. Cl. 313—346 R 8 Claims



1. A dispenser cathode comprising a porous metal body which has an emissive surface and the pores of which contain compounds for dispensing when heated at least barium and scandium to the emissive surface, said compounds comprising at least barium oxide, scandium oxide and aluminum oxide wherein the total quantity of rare earth oxides present including scandium oxide being less than 10% by weight of the overall quantity of the dispensing compounds.

4,007,394

ALKALI METAL ALKALINE EARTH METAL SULFATE PHOSPHOR ACTIVATED WITH CERIUM AND TERBIUM AND LAMP CONTAINING SAME

Jacob G. Rabatin, Chardon, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 7, 1975, Ser. No. 565,643

Int. Cl.² C09K *11/46;* H01J *61/44*

U.S. Cl. 313—486 6 Claims

1. A luminescent material comprising crystals of:

$$M_wCa_xCe_yTb_zSO_4$$

wherein M = Lithium or sodium

$w = y + z$
$x = 1 - (w + Y + z) > 0.3$
$y = 0.05$ to 0.25
$z = 0.05$ to 0.20

said material exhibiting relatively high quantum efficiencies for emissions in the visible green spectral region, when excited by 2537A radiation

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4,007,395

TARGET STRUCTURE FOR USE IN PHOTOCONDUCTIVE IMAGE PICKUP TUBES

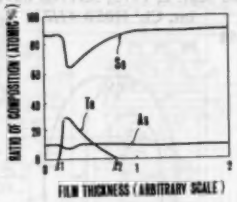
Yasuhiko Nonaka, Mobara; Naohiro Goto, Machida, and Keiichi Shidara, Tama, all of Japan, assignors to Hitachi, Ltd. and Nippon Hoso Kyokai, both of Tokyo, Japan

Filed May 23, 1975, Ser. No. 580,473

Claims priority, application Japan, June 21, 1974, 49-70214

Int. Cl.² H01J *29/45, 31/38*

U.S. Cl. 313—386 14 Claims



1. In a target structure for use in a photoconductive image pickup tube of the type comprising a transparent substrate, an N-type transparent conductive film deposited on the rear side of said substrate, and a P-type photoconductive film deposited on the rear side of said N-type transparent conductive film via heterogeneous junction surface and containing at least selenium and tellurium as an intensifier, the improvement wherein the thickness of the intensifier containing portion of said P-type photoconductive film is made to be within a predetermined range between 500 to 5000 A, said range smaller than the total thickness of said P-type photoconductive film and the starting point of said intensifier containing portion is positioned in a prescribed range of 80 to 1500 A as measured in the direction of thickness of said P-type photoconductive film from said heterogeneous junction surface between said P-type photoconductive film and said N-type conductive film.

4,007,396

LIGHT EMISSIVE DIODE DISPLAYS

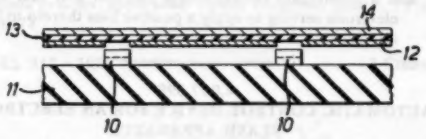
Philip Henry Wisbey, Colchester, and Paul Kevin Kimber, Bishop's Stortford, both of England, assignors to The Marconi Company Limited, Chelmsford, England

Filed Nov. 3, 1975, Ser. No. 628,224

Claims priority, application United Kingdom, Nov. 6, 1974, 47930/74

Int. Cl.² A47B *88/00, 95/00*

U.S. Cl. 313—500 8 Claims



1. A light emissive diode display comprising, in combination:

a base having a plurality of light emissive diodes carried thereby;

a mirror finished conductive layer covering most of the area surrounding said light emissive diodes; and

circular polarizer means overlying said base for allowing light emitted by said diodes to pass therethrough for viewing;

said conductive layer having the characteristic of reversing the handedness of light reflected therefrom whereby light passing through said circular polarizer means and having

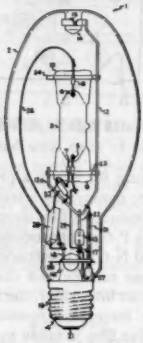
one handedness imparted thereto will upon reflection by said conductive layer have a handedness opposite to said one handedness such that the reflected light will not pass back through the circular polarizer means.

4,007,397

ARC DISCHARGE LAMP WITH STARTER ELECTRODE VOLTAGE DOUBLING

William H. Lake, Novelty, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Sept. 2, 1975, Ser. No. 609,505
Int. Cl.² H05B *41/22*
U.S. Cl. 315—51 **11 Claims**



1. A high intensity arc discharge lamp comprising:
a vitreous arc tube containing an ionizable medium and having main electrodes sealed into opposite ends plus a starter electrode adjacent to the main electrode at one end;
an outer envelope enclosing said arc tube and having a stem at one end with inleads sealed therethrough;
a base attached to said outer envelope and having input terminals, said inleads being connected exteriorly to said input terminals and interiorly to said main electrodes;
a mount comprising at least one conductor extending through said envelope, said mount having attachments to said arc tube for supporting it;
a voltage doubling circuit comprising a diode and a capacitor connected in series across said input terminals and having their junction connected to said mount conductor;
said diode being poled to generate a positive potential at mount conductor member whereby to oppose positive ion electrolysis through the walls of said arc tube;
and a connection between said junction and said starter electrode serving to apply a positive bias thereto to facilitate starting.

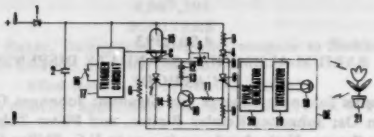
4,007,398

AUTOMATIC CONTROL DEVICE FOR AN ELECTRONIC FLASH APPARATUS

Zenzo Nakamura, Urawa; Shohei Ohtaki, Machida; Takashi Uchiyama, Yokohama, and Hideo Yokota, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 15, 1975, Ser. No. 604,954
Claims priority, application Japan, Aug. 27, 1974, 49-98657
Int. Cl.² H05B *41/32*
U.S. Cl. 315—151 **15 Claims**

1. An automatic control device for an electronic flash apparatus comprising:
a. detecting means including photosensitive means and producing a first control signal in response to a predetermined amount of light incident on said photosensitive means,
b. storage capacitor means,
c. first switching means including a control electrode and two main current carrying electrodes having an anode electrode and a cathode electrode,
d. a flash tube connected in series to said first switching means, said flash tube and first switching means constituting a circuit which is connected to said storage capacitor,
e. means for firing said flash tube,
f. a reverse voltage circuit including commutation capacitor means and second switching means being actuable to a closed condition in response to said first control signal and connected in series to said commutation capacitor



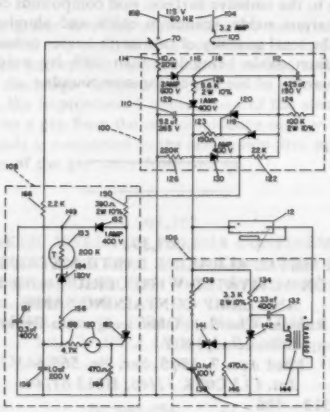
means across the main electrodes of said first switching means, the reverse voltage circuit applying a reverse voltage between the main electrodes of said first switching means,
g. voltage generating means connected to said reverse voltage circuit and producing a second control signal in response to the closing of said second switching means, and
h. shunt circuit means having an input terminal connected to said voltage generating means and responsive to said second control signal for short-circuiting the control electrode and cathode of said first switching means.

4,007,399

FLASHING CIRCUITRY

Roby B. White, Cumberland, R.I., assignor to W. H. Brady Co., Milwaukee, Wis.

Filed June 5, 1975, Ser. No. 584,041
Int. Cl.² H05B *41/34*
U.S. Cl. 315—241 R **4 Claims**



1. A circuit for operation in conjunction with a source of alternating current to deliver a pulse rich in ultraviolet light relative to the total energy of the pulse, comprising:
a first, larger, capacitor;
a second, smaller, capacitor;
a flash tube having an extinction voltage;
a third, trigger, capacitor;
timing means;
switching means; and
a reference junction;
said first capacitor being connected to be charged by said

source during a first portion of a cycle thereof, and to discharge into said second and third capacitors;

said second capacitor being connected to be charged also by said source during a second portion of a cycle thereof, and to discharge through said tube upon triggering thereof;

said trigger capacitor being discharged by said timing means, to fire said flash tube;

said reference junction having a voltage the instantaneous sum of line and that across said first capacitor;

said switching means connecting said first and second capacitors when the voltage at said reference junction exceeds the voltage at said second capacitor; and

said timing electronically reacting to discharge said trigger capacitor at a time when said reference junction has a voltage low relative to said extinction voltage.

4,007,400

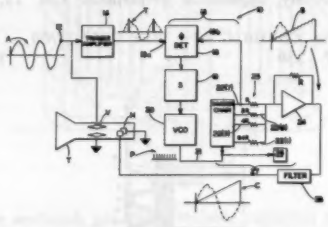
DEFLECTION SYSTEM FOR CATHODE RAY OSCILLOSCOPE

John F. Sutton, 4412 Greenwood Road, Beltsville, Md. 20705

Filed Mar. 11, 1975, Ser. No. 557,439

Int. Cl.² H01J *29/70, 29/72*

U.S. Cl. 315—364 **7 Claims**



1. Automatic self-adjusting deflection system for displaying an integral number of cycles of an external input signal, independent of the frequency of the external input signal comprising:

an x-y display means having a first deflection input responsive to the external input signal for displaying the external input signal on said display means;

means synchronized to a particular recurring portion of the external input signal for generating trigger pulses;

phase locked loop means synchronized to the trigger pulses, including binary divider means for causing said loop means to generate pulses having a repetition rate that is an integral multiple of a repetition rate of the trigger pulses;

means for converting the loop generated pulses to a constant maximum amplitude and uniform staircase signal having a period equal to a duration of the displayed number of cycles of the external input signal, said converting means including a ripple counter having an R-2R ladder circuit connected to an output of said binary divider means; and

means for supplying said uniform staircase signal to a second deflection input of said display means.

4,007,401

CURRENT SENSITIVE CIRCUIT PROTECTION SYSTEM

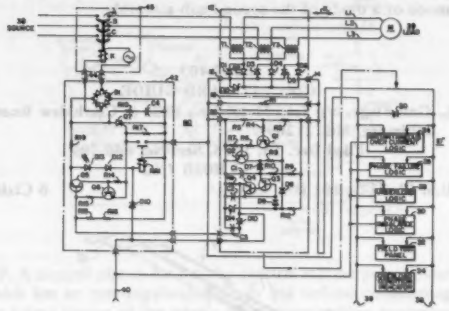
Donald S. Kimmel, Monroeville; Wardell Gary, and Glenn R. Taylor, both of Beaver, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 9, 1974, Ser. No. 504,405

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 13, 1976

Int. Cl.² H02H *3/08, 7/08*

U.S. Cl. 317—36 TD **11 Claims**



1. An electrical circuit protecting device, comprising:

sensor means for sensing circuit current in an electrical circuit, said sensor means having an output for providing an output current related to said circuit current;

replaceable load resistor means connected to said output of said sensor means for converting said output current into a voltage the value of which is variable within a predetermined voltage range for a predetermined range of said circuit current;

a replaceable module connected in parallel circuit relationship with said load resistor means, said module being capable of initiating a circuit breaker trip function, said module being operable over said predetermined range of said voltage; and

circuit breaker trip means connected to said module for opening said electrical circuit when said trip function occurs in said module.

4,007,402

THREE PHASE FULL WAVE RECTIFIER ASSEMBLY

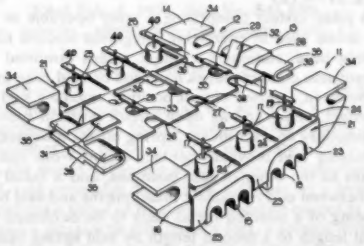
Maurice James Allport, West Midlands, England, assignor to The Lucas Electrical Company Limited, Birmingham, England

Filed May 29, 1975, Ser. No. 581,882

Claims priority, application United Kingdom, June 8, 1974, 25550/74

Int. Cl.² H01L *23/40*

U.S. Cl. 317—100 **2 Claims**



1. A three phase full wave rectifier assembly including first and second sub-assemblies each including three semi-conduc-

tor diodes and an electrically conductive heat sink, the three diodes of the first sub-assembly being secured to the first heat sink with, their anodes electrically connected thereto, by means of a common clip which engages the heat sink, there being resilient means acting between the clip and the diodes to urge the diodes firmly into contact with the heat sink, the second sub-assembly being constructed in a manner similar to said first sub-assembly but with the cathodes of the diodes thereof electrically connected to the heat sink, and three phase connectors, each connector being electrically connected to a cathode of a diode of the first sub-assembly and an anode of a diode of the second sub-assembly.

4,007,403

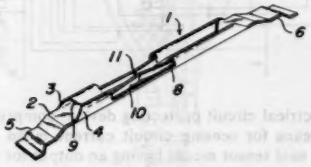
CIRCUIT CARD GUIDE

L. Gail Fiege, c/o Trio Metal Co., Falls & Clarkview Roads, Baltimore, Md. 21209

Filed Dec. 15, 1975, Ser. No. 640,709

Int. Cl.² H02B *1/02*

U.S. Cl. 317—101 DH **8 Claims**



1. A circuit card guide comprising an elongated channel-shaped member, the channel being defined in part by a base and by an upstanding sidewall extending substantially perpendicularly from said base, the upper reach of said sidewall remote from said base extending inwardly over said base in a reentrant bend, a downwardly disposed lip extending from said reentrant bend toward and terminating in spaced relationship from said base, said lip defining one side of a track for receiving a circuit card, at least one portion of said reentrant bend being cut away, the portion of said lip which is contiguous to said cut away portion of said reentrant bend being continuous and having a portion displaced inwardly of said track to form a leaf spring having a surface for resilient engagement with a circuit card disposed in said track.

4,007,404

HIGH GAIN RELAYS AND SYSTEMS

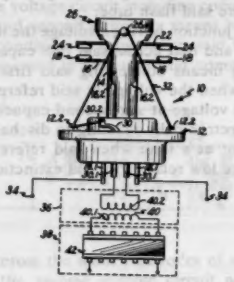
Ernest M. Jost, Plainville; Lyle E. McBride, Jr., Norton, and Teuvo J. Santala, Attleboro, all of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 431,539, Jan. 7, 1974, which is a division of Ser. No. 351,683, April 16, 1973. This application Apr. 11, 1975, Ser. No. 567,152

Int. Cl.² H01H *47/00*

U.S. Cl. 317—123 **3 Claims**

1. A relay system comprising a relay operable at the low power levels used in energizing integrated circuits having an insulating base, stationary contact means mounted on said base, movable contact means mounted on said base for movement between a closed circuit position engaging said stationary contact means and an open circuit position spaced from said stationary contact means, spring means mounted on said base biasing said movable contact means from one of said positions to the other of said positions, and a metal wire secured between said movable contact means and said base, said wire being of a selected metal alloy to be deformed from an original length to a second length by said spring bias as said movable contact means is moved from said one position to said other position by said spring bias while said alloy displays a relatively low modulus of elasticity below a transition temperature and to abruptly return to said original length and to display a relatively higher modulus of elasticity to move said movable contact means back to said one position against said spring bias with a force of at least 15 grams when said wire is heated to said transition temperature, said wire having a selected cross-sectional size and length to be heated from room temperature to said transition temperature by passing electri-



cal current through said wire with a power input of less than about 2 watts for permitting operation of said relay with a gain of at least about 500 to 1 at power levels used in energizing integrated circuits; a power source for directing relay energizing electrical current through said relay wire; and means matching the impedance of said power source and relay wire.

4,007,405

VENT FOR ELECTROLYTIC CAPACITOR HOUSING

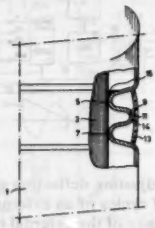
Andries Cornelis Maijers, Eindhoven, and Hendrik Voeten, Zwolle, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 511,663, Oct. 3, 1974, abandoned. This application Jan. 2, 1976, Ser. No. 645,934

Claims priority, application Netherlands, Oct. 15, 1973, 7314130

Int. Cl.² H01G *9/00, 9/16;* **B01J** *17/00*

U.S. Cl. 317—230 **1 Claim**



1. In a capacitor the combination comprising:

a capacitor element;

a metal housing of said capacitor element including two parallel rills extending peripherally around at least a first portion of said housing and formed in a direction interior of said housing, thereby forming two troughs with respect to the exterior of said housing, and a ridge extending circumferentially around at least a second portion of said housing intermediate said two rills and extending in a direction substantially radial to said housing to a point not greater than the extended cylindrical surface of said housing, said ridge being provided with openings therein at the apex of said ridge and spaced apart from said capacitor element for preventing closing of said openings by said capacitor element; and

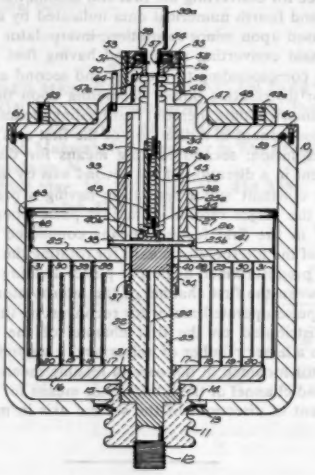
an elastic band extending peripherally around said housing for sealing said openings, said band having a width exceeding the distance between said two troughs formed by

said two parallel rills, and having a concave cross-section with respect to said capacitor element.

4,007,406
HIGH PRESSURE, GAS FILLED, VARIABLE ELECTRICAL PARAMETER DEVICE

Marvin A. Weisbrod, Santa Clara, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Sept. 29, 1975, Ser. No. 617,970
Int. Cl.² H01G 5/14
U.S. Cl. 317—245 **10 Claims**



1. An enclosed, gas-filled, variable capacitor of generally cylindrical shape and including a set of fixed capacitor plates and a set of movable plates interleaving said fixed plates, and first means for varying the amount of said interleaving to vary the capacitance thereof, comprising:

a metallic enclosure having said generally cylindrical shape and first and second end faces;

an extendable and compressible metallic bellows extending from said enclosure first end internally within said enclosure and being connected at its internal end to said movable plate set, said first means being arranged to operate within said bellows to effect variation in the interleaving of said plate sets while maintaining said enclosure sealed;

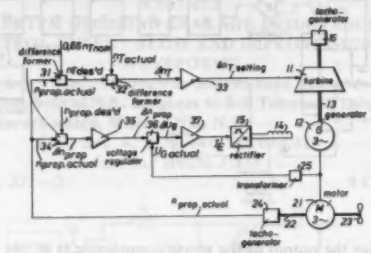
sliding contact means operative over at least a portion of the inside surface of said enclosure in cooperation with said movable plate set to provide a substantially continuous electrical continuity between said enclosure and said movable plates;

and second means at said second enclosure end for insulatingly mounting said fixed plate set, said second means including a feed-through insulator having a metallic stud passing through and sealed into the body of said insulator to provide fixed mechanical support for said second plate set and external electrical connection thereto insulated from said enclosure, said insulator body and said stud projecting partly within said enclosure and partly without.

4,007,407
TURBO-ELECTRIC MARINE POWER PLANT AND METHOD OF REGULATING THE SAME

Klaus Kranert, Hamburg, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Oct. 24, 1974, Ser. No. 517,651
Claims priority, application Germany, Oct. 27, 1973, 2353974
Int. Cl.² H02P 9/00
U.S. Cl. 318—147 **12 Claims**



7. A control circuit for a turbo-electric marine power plant which has an rpm-regulatable heavy gas turbine constituting the prime mover of the power plant; a propulsion generator mechanically connected to the turbine and having a field winding; a propulsion motor electrically connected to the propulsion generator; a propeller shaft driven by the propulsion motor; and a fixed propeller affixed to the propeller shaft; comprising in combination:

a. first sensor means operatively connected to said turbine for responding to the actual turbine rpm and for emitting a first signal representing the actual turbine rpm;

b. second sensor means operatively connected to said propeller shaft for responding to the actual propeller rpm and for emitting a second signal representing the actual propeller rpm;

c. first regulator means operatively connected to said second sensor means for receiving said second signal and for emitting a third signal as a function of said second signal, said third signal representing the desired turbine rpm; and

d. second regulator means operatively connected to said first sensor means and to said first regulator means for receiving said first and third signals, respectively; said second regulator means emitting a fourth signal as a function of said first and third signals, said fourth signal representing the turbine rpm regulating signal; said second regulator means being operatively connected to said turbine for regulating the turbine rpm as a function of said fourth signal.

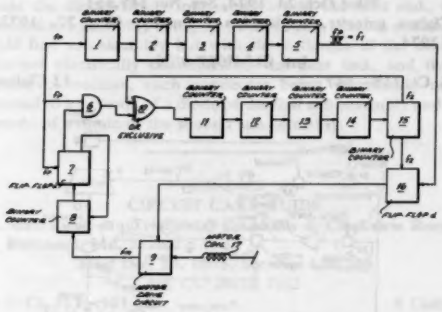
4,007,408
APPARATUS FOR SYNCHRONIZATION OF A MOTOR

Jean-Claude Berney, 3, Chemin des Croix-Rouges, Lausanne, Switzerland

Filed Feb. 4, 1975, Ser. No. 546,889
Claims priority, application Switzerland, Feb. 13, 1974, 1990/74
Int. Cl.² H02P 7/36
U.S. Cl. 318—314 **10 Claims**

1. Apparatus for synchronizing the speed of a motor to a given precise frequency fp, the motor having a drive circuit which furnishes the motor with the necessary energy for its rotation, the motor delivering a frequency fm proportional to its speed, said apparatus comprising a divider by x having an input receiving a signal of frequency fp and an output at which is produced a signal with a frequency fp/x, a second divider of $x + \alpha$ having an input receiving signals of frequency $fm + \alpha y$, said second divider having an output at which is produced a signal with a frequency $f2$, a phase comparator having two states, one of coincidence, the other of non-coincidence, said phase comparator having a first input connected to the output

of the first divider and a second input connected to the output of the second divider, said phase comparator having an output connected to the motor drive circuit to interrupt or re-establish the distribution of energy to the motor according to



whether the output of the phase comparator is in one state or the other to maintain $f2$ equal and in phase with $f1$ and synchronizing fm to a mean value of fp/xy, wherein α, x, and y are whole numbers.

4,007,409

METHOD OF AND DEVICE FOR CONTROLLING A d.c. WASHING MACHINE MOTOR

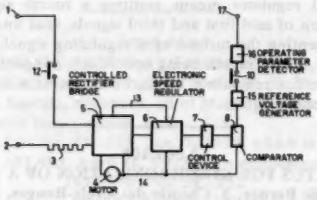
Yves Albert Daniel Thibaut, Amiens, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 6, 1974, Ser. No. 530,168

Claims priority, application France, Dec. 10, 1973, 73.43905

Int. Cl.² G05B *1/00*

U.S. Cl. 318—459 **6 Claims**



1. A method of controlling a d.c. motor of a washing machine in dependence on motor speed and at least one other parameter, by energizing a motor from a controlled rectifying bridge circuit supplied from an alternating current source; supplying a control signal to said bridge circuit from an electronic speed regulator; generating a motor stop signal in a comparator by comparing a back-e.m.f. signal from the motor with a reference voltage from a reference voltage generator; and applying a motor de-energize signal to said regulator in response to a low speed condition and in response to a given other condition; wherein said step of applying a de-energizing signal in response to a given other condition comprises detecting said given other condition and controlling a switch contact responsive to said given condition, and supplying alternating current power to said reference voltage generator from said alternating current source through said switch contact.

4,007,410

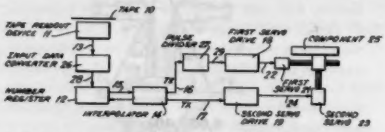
NUMERICAL CONTROL PULSE DISTRIBUTION SYSTEM

Yoshihiro Hashimoto, Yokohama, and Kengo Kobayashi, Kawasaki, both of Japan, assignors to Fujitsu Ltd., Kawasaki, Japan

Continuation of Ser. No. 113,091, Feb. 5, 1971, abandoned. This application Sept. 26, 1972, Ser. No. 291,047

Int. Cl.² G05B *19/24*

U.S. Cl. 318—571 **4 Claims**



1. A numerical control pulse distribution system for moving a component in directions of first and second axes in accordance with first and second numerical data comprising a source of instructions for moving the component in direction of both axes with first and second numerical data indicated by a desired number of pulses; converting means connected to said source for converting the first and second numerical data to third and fourth numerical data indicated by a number of pulses based upon minor resolution; interpolator means coupled to said converting means and having first and second channels corresponding to the first and second axes, respectively, for distributing pulses depending upon the third and fourth numerical data thereon; first feeding means for displacing the component in a direction of the first axis by constant major resolution; second feeding means for displacing the component in a direction of the second axis by minor resolution, the constant minor resolution having a predetermined ratio to the major resolution; a first pulse operated motor included in the first feeding means connected to the first channel of the interpolator means for rotating the first feeding means a predetermined angle per pulse; dividing means coupled between the first channel of the interpolator means and the first pulse operated motor for reconverting the number of pulses distributed on the first channel of the interpolator means to a lesser number of pulses; and a second pulse operated motor included in the second feeding means coupled to the second channel of the interpolator means for moving said component in directions of the second axis in minor resolution.

4,007,411

CUTTING FEED STARTING POSITION CONTROL DEVICE FOR MACHINE

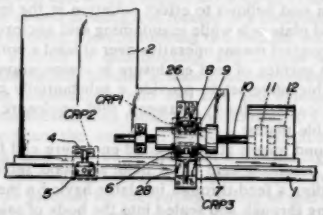
Kojiro Saito, Showa, Japan, assignor to Yutaka Seimitsu Kogyo Ltd., Yono and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Sept. 19, 1974, Ser. No. 507,552

Claims priority, application Japan, Sept. 19, 1973, 48-105565; Sept. 19, 1973, 48-105566

Int. Cl.² G05B *11/01*

U.S. Cl. 318—630 **2 Claims**



1. A cutting feed starting position control device for numerically controlled machine tools comprising a stationary bed, a

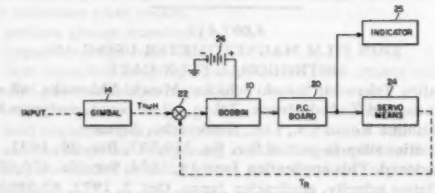
tool carrying column movable thereon, means for dressing said tool after it has become blunt, a movable original position mechanism which can keep its moved position in a constant positional relation to said column to compensate the dimensional difference resulting from said dressing, a magnetic switch means consisting of a first and second part such as a magnetic body and a sensor, said first part mounted on said mechanism and the second part mounted on said column whereby said column can be returned to the position of said mechanism by utilizing a difference between output voltage curves of said switch means resulting from a difference in direction of movement of said column due to hysteresis of said switch means to cancel back-lash between moving parts, second magnetic switch means consisting of a third and fourth part such as a magnetic body and a sensor, said third part mounted on said bed and the fourth part mounted on said mechanism whereby said mechanism can be returned to the position of said third part, and third magnetic switch means consisting of a fifth and sixth part such as a magnetic body and a sensor, said fifth part mounted on said bed and the sixth part mounted on said column whereby after said column has been returned over said fifth part and said mechanism located in the position of said fifth part, said column can be moved forwardly with said mechanism and then can be stopped at the feed starting original position.

4,007,412

COMBINED MEANS FOR SENSING AN INERTIAL CONDITION AND FOR PROVIDING TORQUING AND DAMPING FUNCTIONS

Gunnar J. Vold, Mahwah, N.J., assignor to The Bendix Corporation, Teterboro, N.J.

Filed Mar. 25, 1974, Ser. No. 454,335
Int. Cl.² G05B *11/01*
U.S. Cl. 318—676 **6 Claims**



1. For use with an inertial sensing device, combined means for providing sensing, torquing and damping functions, comprising:

means coupled to the sensing device and displaced about an axis in response to a sensed condition;

circuit means arranged in capacitance relation to the displaced means, and displacement of the displaced means relative to the circuit means changing the capacitance as a function of the sensed condition;

first magnet means;

second magnet means carried by the displaced means and interacting with the first magnet means for providing a force which displaces the displaced means relative to the first magnet means to develop a restoring torque about the axis;

the displacement of the displaced means relative to the first magnet means providing a damping effect;

the means coupled to the sensing device and displaced about an axis in response to a sensed condition includes an arm coupled to the sensing device and a cap shaped member supported at the end of the arm;

the circuit means is supported in spaced relation to the cap shaped member;

the first magnet means includes a permanent magnet, with the cap shaped member surrounding in spaced relation at least a part of the permanent magnet; and

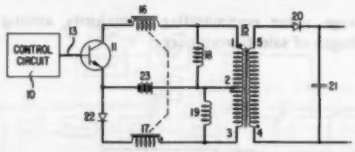
the second magnet means includes a coil wound on the cap shaped member and means for energizing the coil.

4,007,413

CONVERTER UTILIZING LEAKAGE INDUCTANCE TO CONTROL ENERGY FLOW AND IMPROVE SIGNAL WAVEFORMS

Phil Dewey Fisher, Millington, and Richard Howard Hock, Landing, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 8, 1975, Ser. No. 638,315
Int. Cl.² H02M *3/335*
U.S. Cl. 321—2 **9 Claims**



1. A converter circuit comprising:

a power transformer being constructed to have significant leakage inductance between a primary and a secondary winding, said leakage inductance having a reactance magnitude at least one-half the reactance of said primary winding,

means for accepting a voltage source,

a switching device to couple said means for accepting a voltage source to said primary winding,

a unidirectional conducting device connected to said secondary winding and poled to conduct in response to conduction in said switching device, and

means for periodically resetting said leakage inductance comprising a second primary winding tightly coupled to said primary winding and connected to a second unidirectional conducting device poled to conduct in response to a termination of conduction in said switching device whereby current continues to flow in said first unidirectional conducting device in response to conduction in said second unidirectional conducting device in order to control a slope of decay of current in said secondary winding when said switching device ceases conduction.

4,007,414

CURRENT TRANSDUCER ARRANGEMENT

Seiya Shima, Katsuta, and Korefumi Tashiro, Hitachi, both of Japan, assignors to Hitachi, Ltd., Japan

Filed July 9, 1975, Ser. No. 594,252
Claims priority, application Japan, July 12, 1974, 49-79181
Int. Cl.² G01R *19/00*
U.S. Cl. 323—6 **13 Claims**

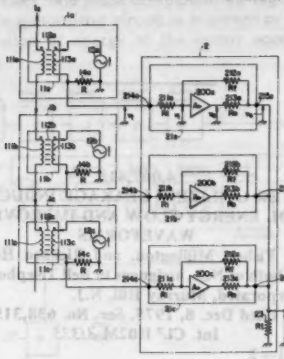
1. A current transducer arrangement for detecting the magnitude and polarity of a large current, comprising:

at least three current transducers each of which includes

a. a reactor having a saturable core, and

b. means for supplying an alternating voltage to said reactor; and

a majority circuit which outputs a voltage proportional to a



voltage value commanding a majority among output voltages of said transducers.

4,007,415

CONSTANT VOLTAGE GENERATING CIRCUIT

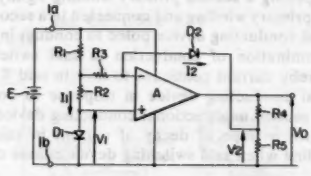
Kenji Toyoda, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Dec. 19, 1975, Ser. No. 642,532

Claims priority, application Japan, Dec. 26, 1974, 49-148387

Int. Cl.² G05F *1/46*

U.S. Cl. 323—19 **7 Claims**



1. In a constant voltage generating circuit which converts power source voltage to a constant voltage, the improvement comprising:

a. a pair of first and second input terminals, to which power source voltage is applied

b. an operational amplifier (OP hereafter) having an output terminal supplying the constant output of the constant voltage generating circuit and two input terminals;

c. a first resistor element connected between the first input terminal and one input terminal of OP;

d. a second resistor element connected between the first input terminal and the other input terminal of OP; and

e. a pair of first and second logarithmic conversion elements generating voltage which is logarithmically proportional to current flowing in itself, the first logarithmic conversion element being connected between the first input terminal of OP and output terminal of OP and the second logarithmic conversion element being connected between the other input terminal and second input terminal of constant voltage generating circuit.

4,007,416

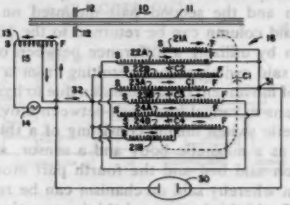
VOLTAGE REGULATING TRANSFORMER

Gabor Szatmari, 203 W. 16th St., Lumberton, N.C. 28358

Filed Aug. 6, 1975, Ser. No. 602,265

Int. Cl.² H01F *15/14*; H05B *41/04*

U.S. Cl. 323—60 **18 Claims**



1. A voltage regulating transformer having load terminals for transferring power from an alternating current source to a load, comprising in combination:

a magnetic core;

a primary winding connectable to the alternating current source and wound about said magnetic core for inducing an alternating magnetic flux therein;

a secondary winding comprising a plurality of paired sectioned windings being wound around and responsive to said magnetic flux in said magnetic core;

means establishing capacitance between said plurality of paired sectioned windings;

means connecting said secondary winding to the load terminals;

and means for modifying said alternating magnetic flux in said magnetic core by harmonic magnetic flux to reinforce the magnetic flux therein at least during a portion of each cycle producing a greater output voltage to the load terminals.

4,007,417

THIN FILM MAGNETOMETER USING AN ORTHOGONAL FLUX GATE

Shinjiro Takeuchi; Satoshi Ichioka; Masaki Shirosaka, all of Toda, and Tadashi Inoue, Tokyo, all of Japan, assignors to Mishima Kosan Co., Ltd., Kitakyushu, Japan

Continuation-in-part of Ser. No. 319,707, Dec. 29, 1972, abandoned. This application June 14, 1974, Ser. No. 479,573

Claims priority, application Japan, Oct. 2, 1972, 47-98833

Int. Cl.² G01R *33/04*

U.S. Cl. 324—43 R **1 Claim**

1. A thin film magnetometer utilizing an orthogonal flux gate and a rotation magnetization mechanism, comprising:

an orthoganol flux gate comprised of a plated wire having a ferromagnetic material thin film having thereon a multi-magnetic domain structure with the easy magnetization axis of the respective magnetic domains in a Gaussian distribution within a range of several degrees around the mean easy magnetization axis and a sensing coil wound on said plated wire, said plated wire and said coil being a magnetic sensing element;

a current source having a sine waveform and coupled to the ends of said plated wire for exciting the ferromagnetic thin film thereon;

an amplitude difference detection circuit means coupled to the said sensing coil for detecting an difference between the positive and negative peak voltage values of the output of said sensing coil and producing an output indicative thereof;

control means operatively connected to the output of said amplitude difference detecting circuit means for producing an erasing current sufficient to erase the magnetic field at said flux gate; a feedback circuit having one end thereof coupled to the output of said control means for feeding back the output of said detection circuit means to said sensing coil;

indicating means consisting of a phase locked amplifier and an ammeter and coupled to the output of said control means and producing an indication of a sensed magnetic field, and

a DC current source connected to said flux gate for generating a magnetic field for erasing an external magnetic field unnecessary for measurement, whereby a micromagnetic field superimposed on an external magnetic field can be measured.

4,007,418

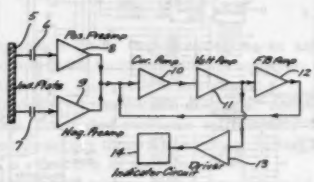
PERSONAL ELECTROSTATIC SAFETY MONITOR WITH INDUCTION PLATE SENSING MEANS

Harry A. Hanna, 3727 University, Apt. No. 2, Des Moines, Iowa 50311

Continuation-in-part of Ser. No. 250,736, May 5, 1972, Pat. No. 3,878,459. This application Apr. 11, 1975, Ser. No. 567,359

Int. Cl.² G01R 31/02, 19/16, 29/12; H05F 3/00

U.S. Cl. 324—72 1 Claim



1. A personal safety monitor for detecting the presence of an electrostatic field and for detecting the rate of transfer of said field from one object to another field, comprising,

an insulating housing and within said housing,

an induction plate means,

a positive charge transistor,

a negative charge transistor,

a first capacitor coupling said induction plate means with said positive charge transistor,

a second capacitor coupling said induction plate means with said negative charge transistor,

a current amplifier comprising a transistor coupled in Darlington fashion to said positive and negative charge transistors,

a voltage amplifier coupled to said current amplifier,

a feed-back amplifier coupled to said voltage amplifier,

said feed-back amplifier also being coupled to the input of said current amplifier,

a driver stage coupled to said voltage amplifier,

and in indicator circuit coupled to said driver stage and comprising a signal means which is energized upon said induction plate means being exposed to an electrostatic field above a predetermined threshold hazard value, the degree of capacitive coupling of said first and second capacitors to said induction plate means and the size and position of said induction plate means with respect to the remainder of said circuit, being such that the circuit is activated only above said predetermined threshold hazard value.

4,007,419

DIGITAL BICYCLE SPEEDOMETER-ODOMETER

Richard Jasmine, 3320 Delmonte Blvd., Space 43, Marina, Calif. 93933

Filed Oct. 2, 1975, Ser. No. 618,810

Int. Cl.² G01P 3/48

U.S. Cl. 324—166 10 Claims

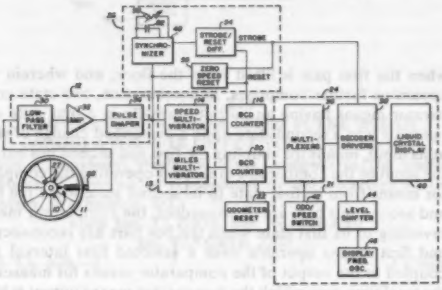
1. A combination speedometer/odometer apparatus for displaying the speed of a vehicle and the distance the vehicle has traveled comprising:

speed pick-up means for detecting the speed of the vehicle and for developing a first voltage signal including voltage spikes, said voltage spikes occurring at a frequency proportional to the speed of the vehicle;

pulse generating means responsive to said voltage spikes and operative to develop a voltage pulse time-coincident with each said spike, said pulses having a predetermined duration;

signal generating means responsive to said pulses and operative to develop a speed signal having a first plurality of bursts with a first plurality of voltage impulses, the number of said first bursts being proportional to the speed of the vehicle, and a distance signal having a second plurality of bursts with a second plurality of voltage impulses, the number of said second bursts being proportional to the total distance the vehicle has traveled;

gate means having a first input for receiving said pulses, a second input and an output, said gate means being operative to block said voltage pulse at said first input whenever a timing signal is present at said second input, and to



pass said voltage pulse to said output in the absence of said timing signal;

timing signal generating means responsive to the voltage pulse passed through said gate means and operative to develop said timing signal, said timing signal having a leading edge, a predetermined duration and a trailing edge;

signal differentiator means responsive to said timing signal and operative to develop a reset signal coincident with said leading edge and a strobe signal coincident with said trailing edge;

first counter means responsive to said reset signal and operative to count said first impulses;

second counter means for counting said second impulses; and

display means responsive to said strobe signal and operative to alternatively display the count outputs of said first and second counter means, the output of said first counter means being indicative of the speed of the vehicle and the output of said second counter means being indicative of the distance the vehicle has traveled.

4,007,420

DEVICE FOR MEASURING A NOCICEPTIVE REACTION OF LABORATORY ANIMALS

Jan Halek, and Jaroslav Jezdinsky, both of Olomouc, Czechoslovakia, assignors to Rektorat University Palackeho v Olomouci, Olomouc, Czechoslovakia

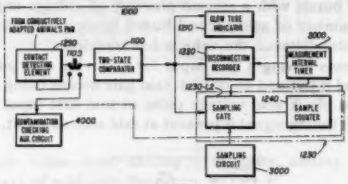
Filed May 8, 1975, Ser. No. 575,502

Int. Cl.² G04F 8/00

U.S. Cl. 324—181 4 Claims

1. In an apparatus for objectively determining a nociceptive reaction of a caged laboratory animal to an irritating stimulus applied to a first paw of the animal, wherein the reaction is manifested by lifting of the first paw from the base of the cage, the improvement wherein substantially the entire floor of the cage is formed from a planar array which comprises, in combi-

nation, a plurality of parallel, dielectrically spaced elongated conductors, the spacing between adjacent ones of the conductors being selected to provide contact between the paw and a pair of adjacent conductors except when the paw is lifted from the floor, first and second mutually insulated bus bars, means for connecting alternate ones of the conductors to the first bus bar, and means for connecting the remaining conductors to the second bus bar; wherein an electroconductive layer is applied over the plantar surface of the first paw whereby the contact of the first paw with the floor normally connects the first and second bus bars through a high-conductivity path, the first and second bus bars being disconnected from each other



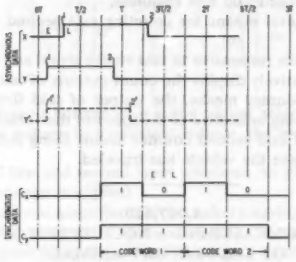
when the first paw is lifted from the floor; and wherein the apparatus further comprises, in combination, two-state comparator means having an output normally in a first state and operable into a second state upon a prescribed change of state at its input, means for coupling the first and second bus bars to the input of the comparator means for operating the comparator means from its first state to its second state when the first and second bus bars are disconnected, the comparator means reverting to its first state when the bus bars are reconnected, and first means operable over a selected first interval and coupled to the output of the comparator means for measuring the total time over which the comparator means output is in its first state over the first interval.

4,007,421

CIRCUIT FOR ENCODING AN ASYNCHRONOUS BINARY SIGNAL INTO A SYNCHRONOUS CODED SIGNAL

Monte Deh Lien, Matawan, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 25, 1975, Ser. No. 607,456
Int. Cl.² H04L *27/02*
U.S. Cl. 325—38 R **10 Claims**



1. In a circuit for encoding transitions in an asynchronous binary signal into synchronous code words, means for examining successive intervals of the asynchronous binary signal for the occurrence of transitions, and means responsive to the occurrence of a first transition within an interval for generating a first code word to indicate the occurrence of the first transition within the interval of actual occurrence, characterized in that the generating means further includes,

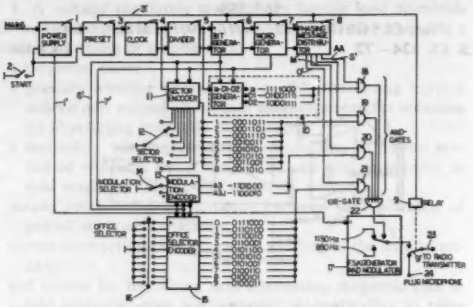
means responsive to the occurrence of a second transition within the same interval for generating a second code word to indicate the occurrence of the second transition within an interval immediately subsequent to the interval in which the second transition actually occurred.

4,007,422

METHOD AND APPARATUS FOR CALLING A GROUND STATION BY AN AIRCRAFT

Herman da Silva, Voorburg, Netherlands, assignor to De Staat der Nederlanden, te Dezen Vertegenwoordigd Door de Directeur-Generaal der Posterijen, Telegrafie en Telefonie, The Hague, Netherlands

Continuation-in-part of Ser. No. 443,499, Feb. 19, 1974, abandoned. This application Sept. 8, 1975, Ser. No. 611,225
Claims priority; application Netherlands, Sept. 4, 1973, 7312158
Int. Cl.² H04B *1/00*
U.S. Cl. 325—55 **17 Claims**



1. A method for calling a receiving station by a mobile transmitting station comprising:

A. generating multi-bit binary first calling code signals (α, D1, D2) indicating idle time signals and call number signals corresponding to numbered receiving stations,

B. alternately transmitting for a predetermined number of cycles said idle time signals in one phase between alternate ones of said call number signals, said call number signals being transmitted in another phase,

C. then generating multi-bit binary second message code signals (S, M, O) of the same number of bits per signal as said first code signals indicating the location of the mobile transmitting station, the mode of modulation of signals to be transmitted later and the call number of the receiving station, and

D. transmitting each of the second code signals twice in succession but in alternate phases and at least twice in each phase.

4,007,423

SYSTEM AND APPARATUS FOR ELECTRONIC SPECTRAL ANALYSIS

Robert V. C. Dickinson, Berkeley Heights, N.J., assignor to Intech Laboratories, Inc., Ronkonkoma, N.Y.

Filed Dec. 9, 1974, Ser. No. 531,049
Int. Cl.² H04B *17/00*
U.S. Cl. 325—67 **9 Claims**

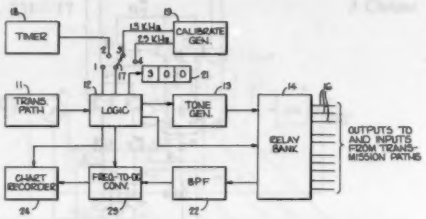
1. In a system in which signals are transmitted along a first transmisson path and such signals are within a predetermined wide frequency band and have a predetermined amplitude relationship with respect to each other, a spectral analysis system for analyzing the amplitude versus frequency characteristics of said path, the system comprising:

A. tunable receiving means at a location on said path, said receiving means having a relatively narrow pass band tunable over said frequency band;

B. amplitude responsive means connected to said receiving means to receive the output signal therefrom and having a predetermined transfer characteristic to produce an

output signal having a predetermined amplitude relationship with respect to the amplitude of the signals received at said location within the pass band of said receiving means at any predetermined time;

C. a voltage controlled oscillator connected to said amplitude responsive means to be controlled by the output signal therefrom to cause the instantaneous frequency of oscillations of said oscillator to have a predetermined relationship to the amplitude of signals received at said location at that instant within the pass band of said receiving means, the frequency of oscillations of said oscillator



being much lower than frequencies in said frequency band and being included within a relatively narrow band compared to said predeterminedband;

D. a frequency-to-amplitude converter connected to said voltage controlled-oscillator to translate the instantaneous frequency thereof to a voltage having an amplitude that is a function of such frequency;

E. a second transmission path connecting said oscillator to said converter; and

F. visual indicating means connected to said converter to display the instantaneous amplitude of the output signal of said converter.

4,007,424

TRANSISTOR SWITCHES FOR SELECTING PROGRAM SIGNALS IN A WIRED BROADCASTING SYSTEM

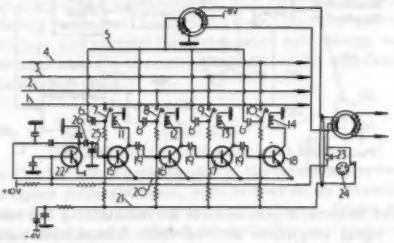
Eric John Gargini, West Drayton, England, assignor to Communications Patents Limited, London, England

Filed Sept. 17, 1975, Ser. No. 613,980

Claims priority, application United Kingdom, Sept. 21, 1974, 41195/74; Oct. 30, 1974, 47066/74

Int. Cl.² H04N 7/10

U.S. Cl. 325—309 **5 Claims**



1. A wired broadcasting system comprising a plurality of programme signal sources, and switch means for making a connection between a signal cable extending to a subscriber and any desired one of said programme signal sources, the switch means comprising a plurality of electro-magnetically operable contacts connected between respective ones of the signal sources and the signal cable, an operating coil in respect of each contact, and a semi-conductor switch in respect of each operating coil comprising a series of transistors with bases, the subscriber being provided with means for controlling the semi-conductor switches to close any one of the contacts and thereby select a programme signal source, each of the programme signal sources providing a voltage signal which, once that programme signal source has been selected, is applied to the respective semi-conductor switch so as to maintain the selection wherein the base of each transistor in the series is connected to a respective operating coil and the transistor has a circuit arranged such that the respective contacts are closed by its conduction and, once the contacts are closed, the said voltage signal maintains the transistor in its conductive state wherein adjacent transistors in the series are connected by capacitive circuits such that when any transistor in the series is turned off the capacitive circuit connecting it to a subsequent transistor in the series is charged, the charge on the capacitive circuit causing the said subsequent transistor to conduct.

4,007,425

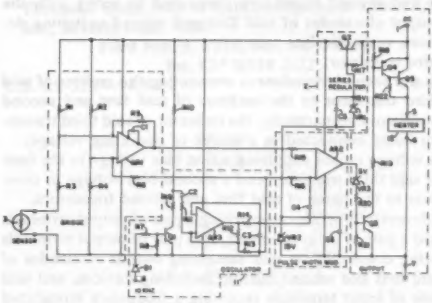
TEMPERATURE SENSOR USING PULSE WIDTH MODULATOR FOR DUTY CYCLE CONTROL

Leroy J. Salisbury, Westford, Mass., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 12, 1976, Ser. No. 648,614

Int. Cl.² G01K 7/00

U.S. Cl. 328—3 **1 Claim**

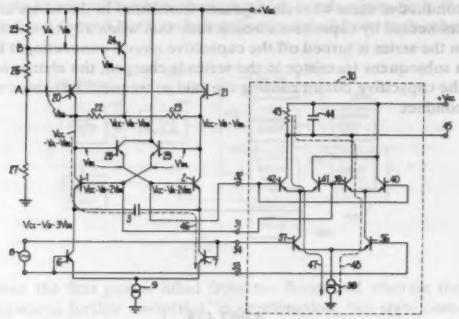


1. A system comprising sensing means having an input and an output for detecting an input signal and presenting it to its output; a freerunning oscillator having a triangular waveform output; pulse width modulating device having inputs connected to the outputs of said sensing means and said oscillator so that the duty cycle output of said pulse width modulator device is varied in accordance with the signal input to said sensing means; said pulse width modulator device is connected to a ground connection; said sensing means and oscillator being maintained at a predetermined voltage above ground; a bridge circuit having outputs connected to said sensing means; one leg of said bridge circuit being fed said signal input; said bridge circuit being a symmetrical bridge circuit; said sensing means being an amplifier having two input terminals connected across said bridge circuit; an amplifier device connected to the input of said oscillator so as to cause said oscillator to operate at the output of the amplifier's oscillations when said amplifier has an input fed to it; said pulse width modulating device being a differential amplifier having first and second inputs; and said first input being connected to the output of said sensing means and said second input being connected to the output of said oscillator.

4,007,426
F-M DEMODULATOR CIRCUIT

Kimitake Utsunomiya, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 427,317, Dec. 21, 1973, abandoned. This application June 13, 1975, Ser. No. 586,730
Claims priority, application Japan, Dec. 21, 1972, 47-128446
Int. Cl.² H03D 3/14
U.S. Cl. 329—103 8 Claims



1. An F-M demodulator circuit comprising:

a multivibrator circuit for producing an oscillating signal and comprisinng first and second current switching devices each having an input electrode and output electrodes, the input electrode of at least one of said devices being connected to one of the output electrodes of the other of said devices, and a capacitor interconnecting the remaining output electrodes of said first and second devices;

first and second transistors connected in series with the output electrodes of said first and second switching devices, respectively;

a third transistor;

first and second impedances connecting the emitter of said third transistor to the emitters of said first and second transistors, respectively, the collector of said third transistor being connected to a source of operating voltage;

bias voltage means supplying a first bias voltage to the base of said third transistor and a second bias voltage in common to the bases of said first and second transistors;

a differential amplifier comprising a pair of output terminals and a pair of input terminals, said pair of output terminals being connected to said remaining output electrodes of said first and second current switching devices, and said pair of input terminals receiving a frequency modulated signal differentially applied thereto; and

means connected with said multivibrator circuit and said differential amplifier for providing a demodulated output signal having an amplitude proportional to the phase difference between said frequency modulated signal and said oscillating signal, and hence, linearly related to the modulating frequency of said frequency modulated signal.

4,007,427
CASCADED TRANSISTOR AMPLIFIER STAGES

Arthur John Leidich, Flemington, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 7, 1976, Ser. No. 674,506
Int. Cl.² H03F 3/45
U.S. Cl. 330—20 11 Claims

1. In combination:

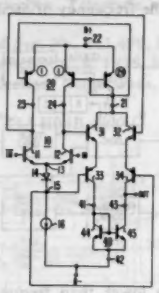
first, second, third and fourth transistors of a first conductivity type, each having base and emitter and collector electrodes;

first and second input terminals at the base electrodes of said first and said second transistors, respectively;

means for connecting said first and said second transistors in long-tailed pair configuration including means for maintaining constant-current flow to an interconnection between the emitter electrodes of said first and said second transistors;

means for regulating the emitter-to-collector potentials of said first and said second transistors including:

means direct coupling the collector electrode of said first transistor and the base electrode of said third transistor;



means direct coupling the collector electrode of said second transistor and the base electrode of said fourth transistor; and

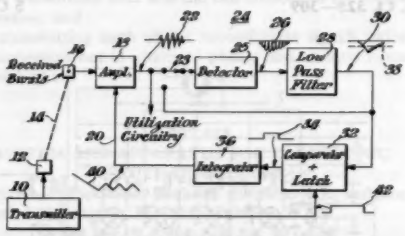
potential follower means for applying potentials to the emitter electrodes of said third and said fourth transistors that follow the potential at the interconnection between the emitter electrodes of said first and said second transistors; and

means biasing the collector electrodes of said third and said fourth transistors for normal transistor operation.

4,007,428
AUTOMATIC GAIN CONTROL OF PULSES

Alvin E. Brown, Claremont, Calif., and Willy J. Fick, Sonderborg, Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Aug. 7, 1975, Ser. No. 602,884
Int. Cl.² H03G 3/20
U.S. Cl. 330—129 5 Claims



1. An automatic gain control for maintaining the received burst signal amplitude derived from transmitted bursts of energy constant comprising, in combination,

an amplifier for amplifying the received signal,

means for varying the gain of said amplifier in accordance with a gain control signal,

latching means for providing a constant amplitude output pulse when said received signal exceeds a predetermined amplitude, and

an integrator coupled to said latching means responsive to said output pulse for generating said gain control signal to decrease the gain of said amplifier at a predetermined rate in the presence of said output pulse and to increase

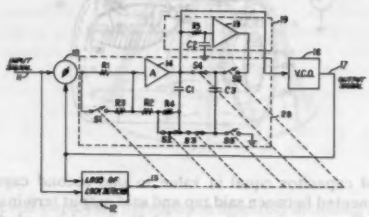
the gain of said amplifier at a predetermined rate in the absence of said output pulse.

4,007,429

PHASE-LOCKED LOOP HAVING A SWITCHED LOWPASS FILTER

Fulvio Cadalora, Mac Mahon, and Pietro Ferrari, Col Moschin, both of Italy, assignors to GTE International Incorporated, Stamford, Conn.

Filed Jan. 19, 1976, Ser. No. 650,057
Int. Cl.² H03B *3/04*
U.S. Cl. 331—17 **3 Claims**



1. A phase-locked loop comprising:

a phase comparator, having first and second inputs and an output, for generating an error signal proportional to the phase difference between the signals applied to said inputs, said comparator receiving an input signal at the first input;

filter means having an output and an input, said input connected to the output of said comparator and receiving said error signal, said filter means also having first and second mutually exclusive bandwidth states, said first bandwidth state operative during tracking periods and said second bandwidth state operative during acquisition periods, said filter means further having a control connection to which a control signal can be applied, and the filter bandwidth state determined by said control signal;

a voltage controlled oscillator having an input and output, said output coupled to said second comparator input, said voltage controlled oscillator generating at its output an output signal whose frequency is responsive to a signal applied to said input;

a loss of lock detector having first and second inputs connected respectively to said first and second comparator inputs, said detector further having an output to said filter control connection and generating a control signal;

charging means coupled to said filter means, for charging all energy storage components in said filter means used only during said first bandwidth state, thereby preventing voltage and current transients when said energy storage components are operatively connected for said first filter bandwidth state.

4,007,430

CONTINUOUS PLASMA LASER

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Willard F. Libby, Los Angeles, Calif.; Carl A. Jensen, Davis, Calif., and Lowell L. Wood, Simi, Calif.

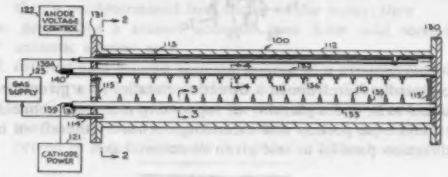
Division of Ser. No. 866,442, Oct. 14, 1969, Pat. No. 3,617,804, which is a continuation of Ser. No. 479,357, Aug. 12, 1965, abandoned. This application Aug. 10, 1971, Ser. No. 170,544
Int. Cl.² H01S *3/00*
U.S. Cl. 331—94.5 D **11 Claims**

1. The method of producing intense monochromatic light from a continuous plasma comprising the steps of:

a. confining a gas at a controlled predetermined reduced pressure of at least 50 microns but below atmospheric pressure;

b. independently controlling the temperature of an electron emitting cathode positioned in said gas to a constant temperature of at least 2500° K to produce an abundant supply of low-energy electrons;

c. applying a predetermined controlled low voltage of from 20 volts to 100 volts to an anode positioned in said gas in an electrical circuit relation with said cathode in which the internal resistance of the circuit is positive so as to draw an intermediate mode current of from 0.1 amperes to less than 100 amperes from said cathode without arcing in order to produce in said confined gas a region having a high density of metastable atomic states and to thus produce from them a low temperature, high density plasma in said region, said intense monochromatic light being emitted as a result of the recombination of ions and electrons in said plasma; and



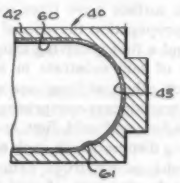
d. establishing a preferred optical direction for light emission and output from said plasma to produce stimulation of emission of radiation in order to obtain laser action and thus produce coherent light.

4,007,431

CATHODE CONSTRUCTION FOR LONG LIFE LASERS

Henry C. Abbink, Westlake Village, and James W. Hostetler, Thousand Oaks, both of Calif., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Filed Feb. 3, 1975, Ser. No. 546,389
Int. Cl.² H01S *3/22*
U.S. Cl. 331—94.5 PE **7 Claims**



1. A cathode for a laser comprising:

a housing having a hollow interior made of a metal forming an electron emitting surface; and

a layer of oxide formed on said electron emitting surface by means of plasma anodization said cathode being the anode for plasms anodization purposes, said oxide layer being thicker at the high field areas of said electron emitting surface.

4,007,432

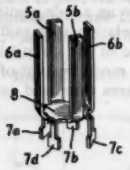
ELECTRO-MECHANICAL FILTER HAVING A PLURALITY OF TUNING FORKS

Junpei Nakamura, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Aug. 28, 1975, Ser. No. 608,689
Claims priority, application Japan, Aug. 29, 1974, 49-103673[U]
Int. Cl.² H03H *9/04, 9/26*
U.S. Cl. 333—71 **8 Claims**

1. An electro-mechanical filter comprising: a single thin

metal sheet configured into a filter having a base portion, at least four vibratory tines connected in circumferentially spaced relationship around said base portion and extending



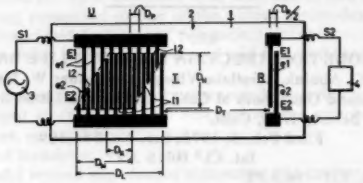
outwardly therefrom in a direction parallel to a given directional axis, and a plurality of supporting members connected to said base portion and extending outwardly therefrom in a direction parallel to said given directional axis.

4,007,433

ELASTIC SURFACE WAVE FILTER

Kouji Houkawa, Kodaira, and Fujio Ishihara, Mito, both of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Filed July 9, 1975, Ser. No. 594,523
Claims priority, application Japan, July 15, 1974, 49-80893
Int. Cl.² H03H *9.04, 9.26, 9.32;* **H01L** *41/10*
U.S. Cl. 333—72 **3 Claims**



1. An elastic surface wave filter comprising at least a substrate for the propagation thereon of elastic surface waves, a transmitting and a first receiving transducer disposed on one major surface of said substrate in a predetermined spaced relation to each other, at least one of said transmitting and first receiving transducers comprising first and second comb-shaped electrodes, and said first and second comb-shaped electrodes being disposed with each electrode element of said second comb-shaped electrode extending between adjacent ones of electrode elements of said first comb-shaped electrode, in which the electrode elements of at least said first comb-shaped electrode are weighted in terms of length and a region formed by an envelope defined by tips of the electrode elements of said first and second comb-shaped electrodes has such a configuration that the extent of the region as measured along a line perpendicular to the lengthwise direction of the electrode elements, as a function of the distance lengthwise along the electrode elements, is substantially constant.

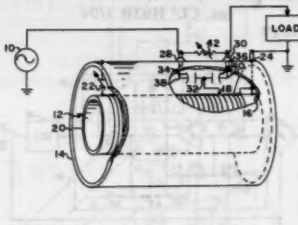
4,007,434

NOTCH FILTER

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of and Glenn B. Shelton, Huntsville, Ala.

Filed Apr. 14, 1976, Ser. No. 676,957
Int. Cl.² H03H *7/10, 7/14, 13/00*
U.S. Cl. 333—75 **5 Claims**

2. A notch filter comprising:
a metal cylinder;
a helical coil positioned within said cylinder about an axis concentric with and spaced from said cylinder;
a first variable capacitor connecting one end of said coil to an adjacent end of said cylinder, and the opposite end of said coil being connected to an adjacent end of said cylinder;
a resistor having a first, input, terminal and a second, output, terminal;
a second capacitor connected between a tap on said coil spaced from said opposite end of said coil and said input terminal;



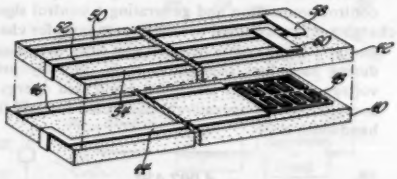
a third capacitor equal in value to said second capacitor connected between said tap and said output terminal; and
a signal source providing signal frequencies including a frequency f_0 connected between said input terminal and said cylinder and an output load connected between said output terminal and said cylinder and wherein the impedance of said coil between said tap and said opposite end, the impedance of said source, and the impedance of said load are all equal at said f_0 frequency.

4,007,435

SENSOR DEVICE AND METHOD OF MANUFACTURING SAME

Tseng-Ying Tien, 660 Archwood Drive, Ann Arbor, Mich. 48103

Continuation-in-part of Ser. No. 384,029, July 30, 1973, abandoned. This application Apr. 25, 1974, Ser. No. 464,019
Int. Cl.² G01N *27/12*
U.S. Cl. 338—34 **20 Claims**



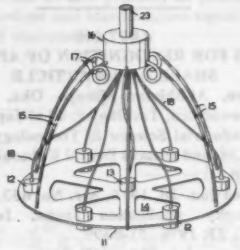
1. An oxygen sensing device particularly suited as a sensor for the exhaust gases of an internal combustion engine, said sensing device comprising an electrically insulative ceramic element having bonded on a surface thereof a layer of an oxygen sensing metal oxide, electrical leads for the oxygen sensing metal oxide, a thin layer of electrical resistance heating material adjacent the layer of oxygen sensing metal oxide but separated from said layer of oxygen sensing metal oxide by a layer of the electrical insulative ceramic, electrical leads for the electrical resistance heating material, and a layer of ceramic covering the layer of electrical resistance material, said device also including a layer of thermistor material bonded to a surface of said ceramic element adjacent said layer of oxygen sensing metal oxide and electrical leads for said thermistor material.

4,007,436

SELF-DEPLOYING INSTRUMENT ASSEMBLY

Garfield W. McMahon, Dartmouth, Canada, assignor to Her Majesty the Queen in right of Canada as represented by the Minister of National Defense, Ottawa, Canada

Filed July 7, 1975, Ser. No. 593,232
Int. Cl.² H04B 13/00
U.S. Cl. 340—8 S 6 Claims



1. A self-deploying hydrophone assembly including a plurality of hydrophones mounted on a flexible sheet, and a series of resilient rods extending from one side of the sheet from positions spaced around the periphery thereof to a hub for stretching the sheet to an operative position and locating the hydrophones at predetermined spacing, the resilient rods being deflectable laterally inwardly whereby the sheet can be folded, placing the assembly in a storable configuration diametrically smaller than its normal operative configuration.

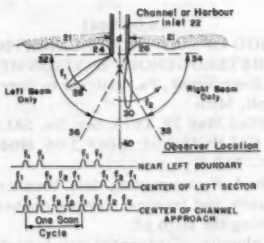
6. A combination of a container and a self-deploying hydrophone assembly, the hydrophone assembly including a plurality of hydrophones mounted on a flexible sheet, and a series of resilient rods extending from one side of the sheet from positions spaced around the periphery thereof to a hub, the container having a longitudinally split body formed by a plurality of separate segments held together by removeable end caps at opposite ends of the segements, the interior width of the body being less than the distance between the opposite rod positions on the sheet, the hydrophone assembly being located within the container with the rods in a laterally-inwardly deflected condition bearing against the interior of the segments, whereby, upon removal of at least one of the end caps the body is forced outwardly by said rods and said assembly deployed.

4,007,437

ACOUSTIC FOGHORN FOR DIRECTIONAL SIGNALING

Maurice Ward Widener, Austin, Tex., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 20, 1975, Ser. No. 606,045
Int. Cl.² G01S 1/72
U.S. Cl. 340—16 R 2 Claims



1. A method of providing bearing information to an operator of a boat or ship located near a channel the entrance having a first and second side thereto comprising:

a. positioning a first non-linear rotatable acoustic source having a narrow beamwidth and being capable of generating frequencies within the audible range of the human ear at the first side of the entrance to said channel;

b. positioning a second non-linear rotatable acoustic source having a narrow beamwidth and being capable of generating frequencies within the audible range of the human ear at the second side of the entrance to said channel;

c. generating a first acoustic tone from said first acoustic source; and

d. rotating said first acoustic source at a predetermined rate thru a predetermined first sector of the water; then

e. generating a second acoustic tone from said second acoustic source; and

f. rotating said second acoustic source at a predetermined rate thru a predetermined second sector of the water;

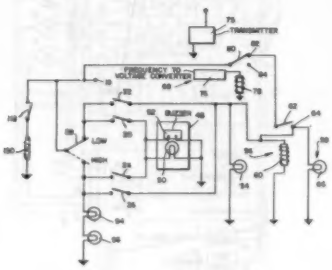
g. continuing the rotation of the first and second acoustic source thru their respective sectors so that any tone received by a boat operator is indicative of his bearing.

4,007,438

SPEED MONITORING AND TICKETING SYSTEM FOR A MOTOR VEHICLE

Peter N. Protonantis, 2164 Hendrison St., Brooklyn, N.Y. 11234

Filed Aug. 15, 1975, Ser. No. 604,912
Int. Cl.² B60Q 1/54
U.S. Cl. 340—62 11 Claims



1. A speed monitoring system for a motor vehicle comprising:

a. a speedometer fixedly mounted within said motor vehicle having a calibrated scale and a movable indicator adapted to visually indicate the speed of said motor vehicle by changing its position on said scale;

b. a source of electrical energy within said motor vehicle;

c. a first circuit closing element adapted to be opened and closed by said movable indicator;

d. a second circuit closing element adapted to be opened and closed by said movable indicator, said first and second circuit closing elements forming a first group;

e. a third circuit closing element adapted to be opened and closed by said movable indicator;

f. a fourth circuit closing element adapted to be opened and closed by said movable indicator, said third and fourth circuit closing elements forming a second group, said first group being associated with a low speed limit and said second group being associated with a high speed limit;

g. a warning circuit energized by said source of electrical energy when said first or said third circuit closing element is closed;

h. a violation indicator mounted externally on said motor vehicle adapted to give an external indication of a speed limit violation;

i. means for energizing said violation indicator by said source of electrical energy in response to the closing of said second or said fourth circuit closing elements; said means remaining energized when said circuit closing elements are therewith opened;

j. a selector means having a first and a second position, said first group of circuit closing elements controlling said warning circuit and said violation indicator when said selector means is placed in said first position and said second group of circuit closing elements controlling said warning circuit and said violation indicator when said selector means is placed in said second position; and

k. circuit breaking means in circuit with said violation indicator adapted to de-energize said violation indicator in response to a transmitted signal of a predetermined frequency.

4,007,439

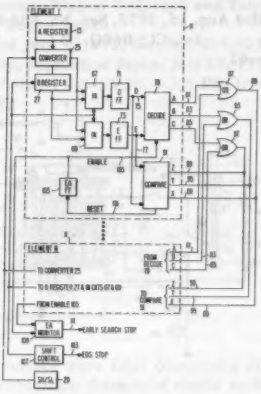
SELECT HIGH/LOW REGISTER METHOD AND APPARATUS

Carl Frederick Semmelhaack, West Chester, and Mark Camillo Divecchio, Phoenixville, both of Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed Aug. 18, 1975, Ser. No. 605,251

Int. Cl.² G06F 7/02

U.S. Cl. 340—146.2 **11 Claims**



1. An apparatus for selecting certain logic elements in a plurality of logic elements, said apparatus including:

a plurality of logic elements;

means for activating individual logic elements in said plurality of logic elements;

a first register in each logic element of said plurality of logic elements, each said first register for storing a numerical value;

converter means associated with each said first register and inputted therefrom, each said converter means for converting said numerical value stored in said first register associated therewith into a pure binary number;

a second register associated with each said converter means inputted therefrom, each said second register for storing said pure binary number of said converter means associated therewith;

means controlling each said second register for repetitively shifting out therefrom at least 2 bits at a time said pure binary stored therein sequentially from the most significant bit to the least significant bit;

means responding to each shifting by said repetitively shifting means for comparing said at least 2 bits shifted out of said second register of each active logic element in said plurality of logic elements with all other said at least 2 bits so shifted out of all other active logic elements in said plurality of logic elements, and for deactivating all active logic elements in said plurality of logic elements having said at least 2 bits shifted out thereof of lower value than said at least two bits shifted out of any other active logic element in said plurality of logic elements; and

means monitoring said repetitively shifting means for indicating when all bits of said pure binary number have been shifted out of each said second register and compared by said means for comparing and deactivating whereby all logic elements in said plurality of logic elements remaining active after said indicating are indicated as being selected.

4,007,440

APPARATUS FOR RECOGNITION OF APPROXIMATE SHAPE OF AN ARTICLE

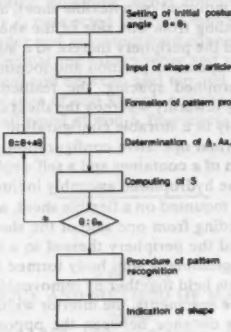
Hidehiko Kono, Akishima; Masayo Oka, Fujisawa, and Sadakazu Kawamura, Tachikawa, all of Japan, assignors to Agency of Industrial Science & Technology; Ikegami Tsushinki Co., Ltd. and Hitachi Denshi Kabushiki Kaisha, all of Tokyo, Japan

Filed Jan. 28, 1976, Ser. No. 653,216

Claims priority, application Japan, Jan. 30, 1975, 50-12885; Jan. 23, 1976, 51-6399

Int. Cl.² G06K 9/00

U.S. Cl. 340—146.3 AC **17 Claims**



1. A method for the recognition of the approximate shape of an article, which comprises finding from the projection of said article the largest width, the largest height and the area of the article relative to a reference line, measuring a pattern-classification value obtainable from the ratio of the area found to the product of said largest width multiplied by said largest height while rotating the postural angle of the article by 180°, calculating the average value and the maximum range of variation from the pattern-classification value measured in consequence of said 180° rotation, integrally comparing the resulting average pattern-classification value and maximum range of variation with the average pattern-classification values and maximum ranges of variation of a desired number of reference patterns and consequently determining the degree of similarity of the shape with the relevant reference pattern.

4,007,441

METHOD OF DATA COMMUNICATIONS IN A HETEROGENOUS ENVIRONMENT

Ulbe Faber, Honeybrook, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed May 29, 1975, Ser. No. 581,940

Int. Cl.² H04J 3/08; G06F 5/06; H04Q 9/00

U.S. Cl. 340—147 R **7 Claims**

1. A method of transmitting data between a plurality of processing units and terminal devices connected to a serial loop comprising the steps of:

forming a plurality of sequential trains of information carrying signals; each of said information carrying signals having an identical time duration;

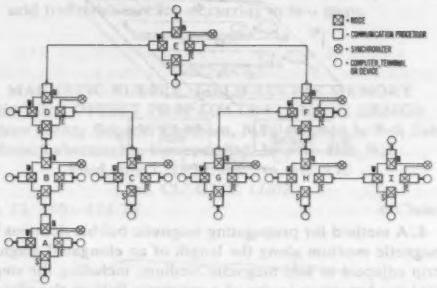
preceding each of said plurality of sequential trains of infor-

mation carrying signals with an identification signal to form a plurality of characters, said identification signal being at least twice the time duration of one of said information carrying signals;

ending each of said identification signal and said information carrying signal with a signal level transition;

transmitting to said serial loop each of said plurality of characters;

detecting at each of said plurality of processing units and terminal devices said identification signal of each of said plurality of characters;



isolating at each of said plurality of processing units and terminal devices said signal level transitions occuring at the end of each of said information carrying signals and said control signals;

deriving from said isolated signal level transitions at each of said plurality of processing units and terminal devices clock information for controlling information transfer with said serial loop; and

synchronizing said information transfer with said detection of said identification signal.

4,007,442

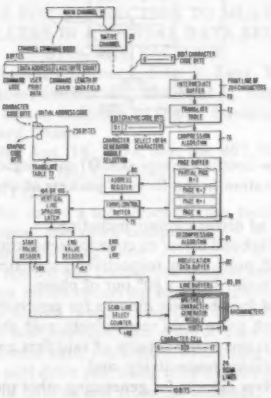
INTERMIXED LINE HEIGHTS AND BLANK LINE FORMATION IN A BUFFERED PRINTER

Gerald Ivan Findley, Morgan Hill, and Teddy Lee Anderson, San Jose, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 11, 1974, Ser. No. 522,995

Int. Cl.² G06F *3/12, 7/32, 13/00*

U.S. Cl. 340—172.5 **16 Claims**



1. An arrangement for printing characters of variable height represented by received data comprising:

buffer means;

means responsive to the received data for assembling the data into a page comprised of plural lines in the buffer means;

means responsive to the received data for providing a separate identification of desired character height for each of the lines of the page;

means responsive to the received data arranged into a page in the buffer means for printing on a medium the characters represented by the data, one line at a time; and

means responsive to the identification of desired character height for each line for providing the characters in the line with the desired height as the line is printed.

4,007,443

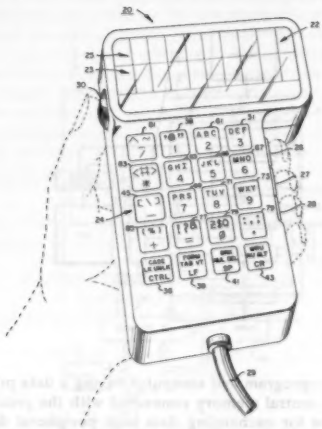
HAND-HELD INTERACTIVE TERMINAL

Michael Arnold Bromberg, Boston, Mass.; William E. Fletcher, Nashua, N.H.; Richard E. Morley, Greenville, N.H., and George G. Schwenk, Nashua, N.H., assignors to Termiflex Corporation, Nashua, N.H.

Filed May 6, 1974, Ser. No. 467,283

Int. Cl.² G06F *3/00;* **H04M** *11/00*

U.S. Cl. 340—172.5 **68 Claims**



1. An improved interactive terminal for communication with external data processing means, having:

A. an alphanumeric display for visually presenting information received and transmitted;

B. a memory communicating with said display for storage and processing for display at least a portion of the information received and transmitted;

C. at least N-1 shift level control keys operable and holdable by the user's first hand for selecting any of N information levels. N being an integer greater than 1;

D. an information entry keyboard operable by the user's second hand wherein each of a plurality of the keys of said keyboard represents the transmission of N different units of information, each unit of information corresponding to a different information level;

E. information transmission means communicating with said keyboard and shift level control keys for transmitting selected keyboard information to at least said external data processing means;

F. information receiving means communicating with said external data processing means and said memory for receipt of information; and

G. housing means dimensioned for the palm of the user's first hand having a front face dimensioned for mounting said keyboard, and at least one side dimensioned for mounting said shift level control keys,

whereby the fingers of the user's first hand select desired shift

level control keys and the user's second hand selects the desired keys of the information entry keyboard; wherein the improvement comprises:

H. light modulation means communicating with said alphanumeric display for repetitively varying the amplitude of the light intensity of the display.

4,007,444

MICROPROGRAMMED COMPUTING DEVICE

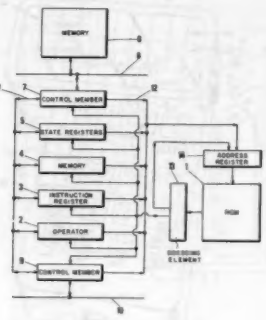
Francois Anceau, Gieres; Claude Beauducel, Franconville; Pierre Courboulay, Paris, and Jacques Cretin, Le Chesnay, all of France, assignors to Institut Francais du Petrole, des Carburants et Lubrifiants et Entreprise de Recherches et d'Activites Petrolieres Elf, France

Filed Nov. 13, 1975, Ser. No. 415,326

Claims priority, application France, Nov. 27, 1972, 72.42157

Int. Cl.² G06F *9/00*

U.S. Cl. 340—172.5 **3 Claims**



1. In a microprogrammed computer having a data processing system, a central memory connected with the processing system, means for exchanging data with peripheral devices through at least one data transfer channel, and a microprogrammed device comprising a read only memory, the read only memory being provided with a set of microprograms wherein at least a first microprogram serves for controlling the execution of instructions issued from the central memory, a second microprogram serves for establishing a hierarchy between the lists of tasks associated with exchange processes of the same type or with the computing process and making the processing system available for the task heading the priority task list, and a third microprogram serving for establishing non hierarchized lists of actuable tasks associated with different processes of the same type, the improvement comprising state resistor assembly means including a first memorizing means connected with the second and third microprograms for memorizing a signal from the third microprogram indicating the state of the task list associated with the computing and exchange process and providing an output indicative thereof to the second microprogram, a second memorizing means connected with the first, second and third microprograms for memorizing a signal from the third microprogram indicating that an actuable list of tasks takes priority with respect to an active task list and providing an output indicative thereof to the first microprogram, and a third memorizing means connected with the first and second microprograms for memorizing a signal from the second microprogram indicating the type of exchange or computing process being performed by the processing system and providing an output indicative thereof to the first microprogram.

4,007,445

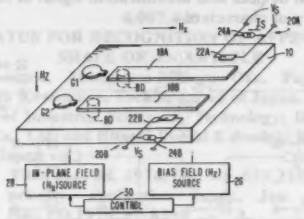
MINIMUM STRUCTURE BUBBLE DOMAIN PROPAGATION

George E. Keefe, Montrose, and Yeong S. Lin, Mount Kisco, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1974, Ser. No. 537,800

Int. Cl.² G11C *11/14*

U.S. Cl. 340—174 TF **23 Claims**



4. A method for propagating magnetic bubble domains in a magnetic medium along the length of an elongated magnetic strip adjacent to said magnetic medium, including the step of applying repetitive cycles of a magnetic field in the plane of said medium and directed parallel to said magnetic strip, each said cycle of said external magnetic field being characterized by an amplitude versus time waveform having at least two unequal parts with respect to time or amplitude.

4,007,446

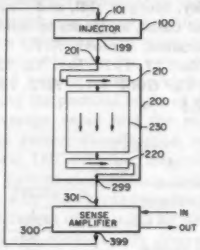
MULTIPHASE SERIES-PARALLEL-SERIES CHARGE-COUPLED DEVICE REGISTERS

Ben R. Elmer, Glendale; Wallace E. Tchon, and Anthony J. Denboer, both of Phoenix, all of Ariz., assignors to Honeywell Information Systems, Inc., Phoenix, Ariz.

Filed June 30, 1975, Ser. No. 592,156

Int. Cl.² G11C *11/40*

U.S. Cl. 340—173 R **24 Claims**



1. A charge-coupled device (CCD) shift register for storing bits of information in the form of packets of charge comprising:

a plurality of driver circuits including:

first and second driver circuits for generating a first and a second pulse train respectively, said first and second pulse trains being 180° out of phase,

third and fourth driver circuits for generating a third and a fourth pulse train respectively, said third and fourth pulse trains being subsets of said first and said second pulse trains respectively, and

other driver circuits for generating other pulses, a first set of said other pulses corresponding to said first pulse train and a second set of said other pulses corresponding to said second pulse train;

input means responsive to said third and said fourth pulse

trains for serially transferring said packets of charge through said input means;

output means responsive to said first and said second pulse trains for serially transferring said packets of charge through said output means; and

central storage means responsive to said other driver circuits for parallel transfer of a plurality of said packets of charge through said central storage means, said central storage means coupled to receive in parallel said plurality of said packets of charge from said input means and coupled to transmit in parallel said plurality of said packets of charge to said output means, said reception and said transmission each occurring in two steps.

4,007,447

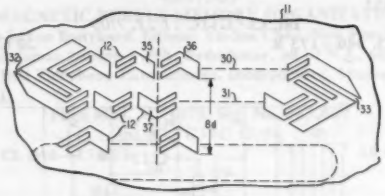
MAGNETIC BUBBLE, FIELD-ACCESS MEMORY HAVING OFFSET PROPAGATE ELEMENT DESIGN

Andrew Henry Bobeck, Chatham, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 1, 1975, Ser. No. 592,175

Int. Cl.² G11C *11/02*

U.S. Cl. 340—174 TF **6 Claims**



1. A magnetic device comprising a layer of material in which single wall domains can be moved, and means for moving domains along a path in response to a magnetic drive field reorienting in the plane of said layer, said means comprising a plurality of elements defining closed loop paths for said domains, each of said paths having first and second turns as well as first and second legs the latter being organized for moving domains in opposite directions, said device being characterized in that the elements in said first leg are offset along the axis of movement from the symmetrical positions of the elements in said second leg.

4,007,448

DRIVE FOR CONNECTION TO MULTIPLE CONTROLLERS IN A DIGITAL DATA SECONDARY STORAGE FACILITY

Winston O. Sergeant, Harvard; John V. Levy, Maynard; Demetrios Lignos, Chelmsford, and Kent M. Griggs, Newtonville, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Aug. 15, 1974, Ser. No. 497,700

Int. Cl.² G06F *3/06*

U.S. Cl. 340—172.5 **16 Claims**

1. A drive for use in a secondary storage facility for a data processing system, said drive comprising:

A. a medium for storing data,

B. first and second bus connection means, each of said bus connection means receiving address signals, control signals, data signals representing data to be transferred to and from said medium, and control data signals representing control data, the control data being transferred to and from said drive and being used by said drive to effect transfers of data to and from the medium,

C. data path means for carrying data signals to and from said medium,

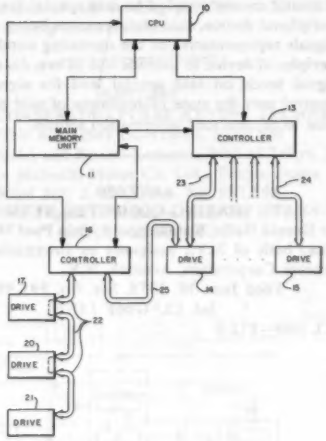
D. selection means for transmitting selection signals that identify, in a first state, said first bus connection means as a selected bus connection means and said second bus connection means as a nonselected bus connections means and that identify, in a second state, said first bus connections means as the nonselected bus selection means and said second bus connection as the selected bus connection means,

E. first switch means for selectively coupling said data path means to said selected bus connection means in response to the selection signals,

F. first and second control sections connected, respectively, to said first and second bus connection means and to said selection means, said selection means being responsive to signals from said first and second control sections, each of said control sections including:

i. means responsive to the control and address signals and to the selection signals for receiving the control data signals from said bus connection means connected to it,

ii. means responsive to the address and control signals at its bus connection means, when it is the selected bus connection means, for controlling the transmission of



control data signals onto said selected bus connection means for a transfer of control data from said drive, and

iii. means responsive to the address and control signals at its bus connection means when it is the nonselected bus connection means for transmitting control data signals having a unique value to said nonselected bus connection means thereby to indicate that said drive is not conditioned to respond to the address and control signals,

G. control means connected to said data path means for controlling transfers of data signals to and from said medium over said data path means, and

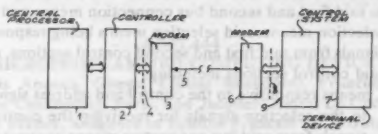
H. second switch means connected to said control means, said first and second bus connection means and said selection means for coupling the address and control signals at the selected bus connection means to and from said control means in response to the selection signals thereby to enable the transfer of control data signals to and from said control means.

4,007,449

CONTROL DEVICE FOR LOCAL CONNECTION OF A PERIPHERAL UNIT THROUGH A MODEM INTERFACE FOR REMOTE CONNECTION

Giacomo Vercesi, Milan, Italy, assignor to Honeywell Information Systems Italia, Caluso, Italy

Filed Oct. 11, 1974, Ser. No. 514,144
Claims priority, application Italy, Nov. 9, 1973, 31096/73
Int. Cl.² G06F *3/04, 3/12*
U.S. Cl. 340—172.5 **6 Claims**



1. An electronic control system for locally connecting a peripheral device to a control unit adapted to control the transmission of information signals to a remote terminal, said control system comprising:

means connecting said control system to said peripheral device, a standard modem interface including a plurality of leads coupling said control system to said control unit and adapted for remote signal transmission, said interface further including a special lead;

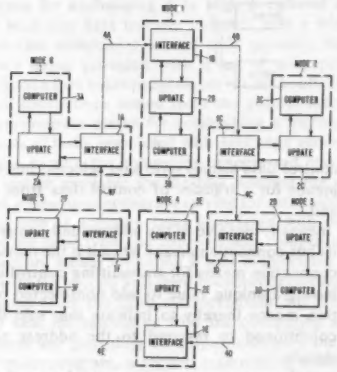
and circuit means coupled to said special lead and to said peripheral device, said circuit means being responsive to signals representative of the operating conditions of said peripheral device to provide one of two distinct electrical signal levels on said special lead for signaling to said control unit the state of readiness of said peripheral device to receive said information signals.

4,007,450

DATA SHARING COMPUTER NETWORK

Luther Harold Haibt, Katonah, and Alvin Paul Mullery, Chappaqua, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1975, Ser. No. 591,993
Int. Cl.² G06F *15/16*
U.S. Cl. 340—172.5 **13 Claims**



1. In a network having a plurality of independently operating data processing units disposed at a plurality of discrete nodal positions and interconnected by a data communication link, each said unit having a memory storing a plurality of data sets, predetermined ones of which are stored at a plurality of units in the network for local independent use thereat, the improvement comprising,

a. means at each of said nodal locations for storing indicia manifestive of the nodal storage locations of each respective multiply-stored data set;

b. means at each of said nodal locations operated responsive to a locally generated update signal for a given data set, and under control of said stored indicia, for initiating and transmitting updating orders to all other nodal units storing the given data set; and

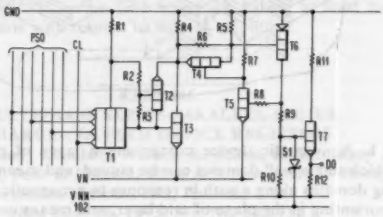
c. means at each of said nodal locations operated responsive to updating orders addressed to it for updating the given data set in its own associated memory.

4,007,451

METHOD AND CIRCUIT ARRANGEMENT FOR OPERATING A HIGHLY INTEGRATED MONOLITHIC INFORMATION STORE

Klaus Heuber, Boeblingen; Wilfried Klein, Holzgerlingen; Knut Najmann, Gaertringen; Rolf Remshardt, Boeblingen, and Siegfried K. Wiedmann, Stuttgart, all of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 20, 1975, Ser. No. 633,733
Claims priority, application Germany, May 30, 1975, 2523853
Int. Cl.² G11C *11/23, 7/00*
U.S. Cl. 340—173 R **20 Claims**



1. A method of operating an information store, in particular a monolithic information store, whose storage cells and address circuits comprise bipolar transistors which are not continuously subjected to full power, characterized in that the address circuits, in particular the decoders, are subjected to full voltage both in the selected and the non-selected state, that at the beginning of a selection phase the current (ICT3) in the selected decoders (BD and ED) increases disproportionally as a result of control signals (102) controlled by the clock (CL), subsequently dropping to a residual current (IR), in order to keep the selected decoders (BD or ED) in the selected state, and that at the end of a selection cycle the decoders (BD and ED) are immediately controlled into their non-selected state as a function of the drop in the control signal (102).

4,007,452

WAFER SCALE INTEGRATION SYSTEM

Marcian E. Hoff, Jr., Sunnyvale, Calif., assignor to Intel Corporation, Santa Clara, Calif.

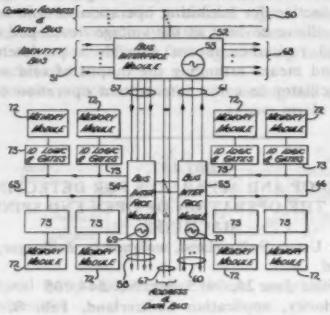
Filed July 28, 1975, Ser. No. 599,709
Int. Cl.² G11C *17/00*
U.S. Cl. 340—173 R **20 Claims**

1. In a semiconductor wafer which includes a plurality of circuit units fabricated on said wafer and a first bus for communicating with said devices an improvement comprising:

a second bus disposed on said wafer for transmitting an identification signal to said units;

circuit means disposed on said wafer and coupled to said

second bus for selectively altering said identification signal along said second bus;



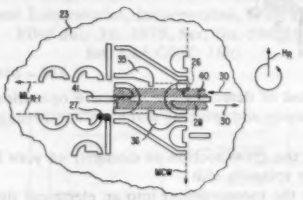
whereby said circuit means may provide an identification signal to each useable circuit unit on said wafer.

4,007,453

MAGNETIC BUBBLE MEMORY ORGANIZATION

Peter Istvan Bonyhard, Edison; Yu-Ssu Chen, New Providence, and James Lanson Smith, Bedminster, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 31, 1975, Ser. No. 563,664
Int. Cl.² G11C *11/14*
U.S. Cl. 340—174 TF 18 Claims



1. A magnetic arrangement comprising a layer of material in which single wall domains representative of data can be moved, a pattern of elements responsive to a magnetic field reorienting cyclically through at least first and second consecutive half cycles in the plane of said layer for moving said domains, said pattern defining a first pair of associated first and second channels and a first exchange position therebetween, said exchange position including ones of said elements in each of said associated channels, said ones of said elements in each of said channels being operative in response to said field for moving a domain from a first position to a second position in said channel, and a conductor arrangement operative when pulsed to move data from said first positions in said first and second channels to said second positions in said second and first channels, respectively.

4,007,454

APPARATUS FOR REMOTELY DETERMINING THE ANGULAR ORIENTATION, SPEED, AND/OR DIRECTION OF ROTATION OF OBJECTS

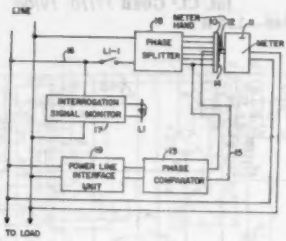
Charles Cain, Greenville, and Arthur T. Shankle, Raleigh, both of N.C., assignors to Charles J. Cain, Greenville, N.C.

Filed Sept. 12, 1975, Ser. No. 612,684
Int. Cl.² G08C *19/10*
U.S. Cl. 340—200 16 Claims

1. An apparatus for remotely monitoring the angular position, speed, and/or direction of rotation of a member as it rotates about an axis of rotation and defines a circumferential path comprising:

a. means for generating a rotating electric field which defines a path parallel to said circumferential path of the rotating member and includes said circumferential path therein;

b. a reading electrode means fixedly positioned within said electric field and symmetrically placed with respect to said axis of rotation for sensing a voltage change responsive to the crossing of said rotating member by said rotating electric field and emitting an output signal responsive to said voltage change; and



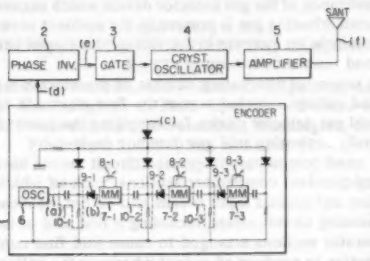
c. said means for generating the rotating electric field and said reading electrode both being positioned in confronting, spaced relation to, but in no way mechanically or electrically connected to said rotating member other than that a portion of said rotating member is within the path of said rotating electric field.

4,007,455

ENERGY CONSERVING PULSE KEYING TECHNIQUE FOR A RADIO CONTROL SYSTEM

Kenichi Mabuchi, and Koziro Komatsu, both of Tokyo, Japan, assignors to Mabuchi Motor Co. Ltd., Tokyo, Japan

Filed July 2, 1975, Ser. No. 592,558
Claims priority, application Japan, July 20, 1974, 49-83373
Int. Cl.² H04B *7/00*
U.S. Cl. 343—225 11 Claims



1. In a radio control system which includes a transmitter having an encoder for generating control pulses of variable widths and a timing pulse, means for generating a carrier wave, and a transmitting antenna; a receiver having a receiving antenna and a decoder; and servomechanisms which are fed with the decoded signals from the decoder and are controlled in response to the widths of the control pulses, the improvement comprising means for restricting the carrier wave to be present throughout the time interval between the trailing edge of each control pulse and the leading edge of the next control pulse, to be present throughout the time interval between the trailing edge of the timing pulse and the leading edge of the first control pulse, and to be present throughout the time interval between the leading edge of the timing pulse and the trailing edge of the last control pulse, all of said time intervals being equal to each other, and wherein the control system responds to control signals having high and low levels

and including said restricted carrier wave, said control signals comprising the aforesaid control pulses.

4,007,456

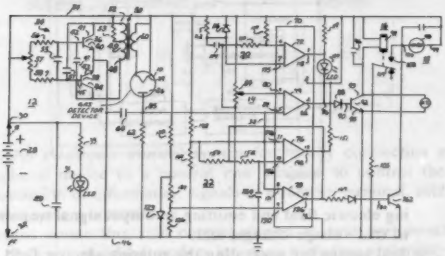
GAS DETECTING AND WARNING SYSTEM

Roy C. Paige, Ravena, and Jonathan B. Wright, Schenectady, both of N.Y., assignors to Craftor Inc., Albany, N.Y.

Filed Dec. 1, 1975, Ser. No. 636,537

Int. Cl.² G08B *17/10, 19/00*

U.S. Cl. 340—237 R **19 Claims**



1. A gas detecting and warning system comprising;

a. A gas detector device of the type comprising a semiconductive body adapted to be thermally activated and exhibiting a resistance characteristic which changes in the presence of a contaminating gas in the ambient environment, said device having a first electrode means arranged for thermally activating said body and a second electrode means operatively associated with said body and spaced from said first electrode means;

b. a direct current source;

c. a load resistance means;

d. means connecting said load resistance means in series circuit relationship with said first and second electrode means and said direct current source operative to produce a current flow through said gas detector device and said load resistance means whereby a decrease in the resistance of the gas detector device which occurs when a contaminating gas is present in the ambient environment results in an increase in the voltage developed across said load resistance means;

e. a source of alternating current of preselected frequency and voltage coupled across the first electrode means of said gas detector device for supplying the power for thermally activating said gas detector device;

f. a quad comparator integrated circuit means having four independent comparator sections, each of which having first and second input means and an output means;

g. Sensing circuit means including a first one of said comparator sections arranged to cause said first comparator section to produce an output whenever the voltage developed across said load resistance means equals or exceeds a preselected value;

h. time delay means including a second one of said comparator sections and a series resistance-capacitance combination arranged to cause said second comparator section to produce an output after said capacitance is charged to a preselected level so that said second comparator section output is produced a predetermined time after energization of the system;

i. a warning alarm means;

j. coincidence means responsive to the outputs of said first and second comparator sections, said coincidence means being also arranged so that the output thereof causes energization of said warning alarm means; and

k. failure detecting and warning means operative to cause an intermittent operation of said warning alarm means as a distinctive warning of a failure or malfunction of said gas detector device and/or its associated circuitry, said failure detecting and warning means comprising said third and fourth comparator sections, means arranging said third comparator section for operation as a free running square-wave oscillator, means including said fourth comparator section for inhibiting operation of said square-wave oscillator so long as the voltage developed across said load resistance means exceeds a predetermined value, and means arranging the output of said square-wave oscillator to cause intermittent operation of said warning alarm means.

4,007,457

METHOD OF AND APPARATUS FOR DETECTING FAULTS IN THE OPERATION OF OPEN-END SPINNING MACHINES

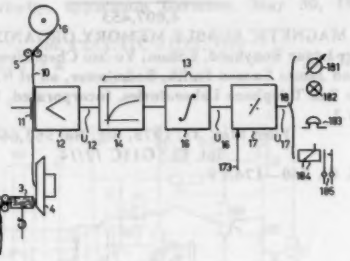
Kurt Aeppli, Uster, Switzerland, assignor to Zellweger, Ltd., Switzerland

Filed Jan. 24, 1975, Ser. No. 544,005

Claims priority, application Switzerland, Feb. 8, 1974, 1739/74

Int. Cl.² G08B *21/00*

U.S. Cl. 340—259 **38 Claims**



7. A method of detecting the defective operation of spinning units in open-end spinning machines comprising the steps of

measuring the cross-section or diameter of yarn leaving at least one spinning unit,

converting the measurement into an electrical signal, and

processing said electrical signal in a discriminator to detect irregularities in said measurement by

applying a non-linear characteristic to said electrical signal with a correcting device receiving said electrical signal to provide a corrected signal which emphasizes larger deviations of said cross-section or diameter of said yarn over smaller deviations thereof,

integrating said corrected signal in an integrator connected to said correcting device to determine the frequency of occurrence of said larger deviations of said yarn, and

comparing the integrated signal with a predetermined reference signal in a comparator connected to said integrator,

thereby generating a control signal upon the occurrence of predetermined deviations of said cross-section or diamter of said yarn.

4,007,458

DIGITAL TWO-WIRE IRRIGATION CONTROL SYSTEM

Michael D. Hollabaugh, San Jose, Calif., assignor to Clemar Manufacturing Corporation, Azusa, Calif.

Filed Dec. 29, 1975, Ser. No. 644,617

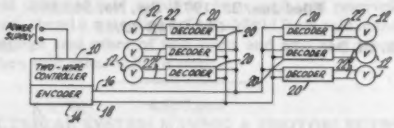
Int. Cl.² H04M *11/04*

U.S. Cl. 340—310 R **12 Claims**

1. Decoding apparatus for use in an irrigation control system in which both power and control signals are transmitted from a central location along a single pair of conductors, said apparatus comprising:

rectifier means for generating a direct-current signal from a basically sinusoidal received power signal, and for dividing the power signal into a first signal reflecting power signal excursions only in one direction with respect to a zero reference, and a second signal reflecting power signal excursions only in the other direction, the presence of excursions of said first signal being indicative of encoded ones;

electronic switch means for connecting the direct-current



signal from said rectifier means to at least one valve solenoid;

means for indentifying said decoding apparatus; and

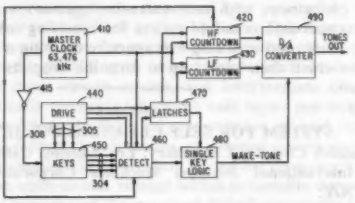
digital logic means utilizing complementary metal-oxide-semiconductor logic for deriving sets of control signals and decoder addresses from said first signal, and for operating said electronic switch means in accordance with those of said control signals accompanied by a decoder address equivalent to said means for identifying said decoding apparatus.

4,007,459

MULTITONE PUSHBUTTON DIAL PHASE SHIFT SCANNING CIRCUITRY

David William Hagelbarger, Morristown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 10, 1975, Ser. No. 594,819
Int. Cl.² G08C 1/00
U.S. Cl. 340—365 S **25 Claims**



25. In an arrangement for identifying an actuated switch in a matrix array of such switches wherein plural intersecting row and column circuits have a different one of said switches coupled between the intersecting row and column circuit at each matrix circuit intersection, the improvement comprising

means for coupling first signals having a first phase through a predetermined impedance to all of said row circuits, said impedance being much smaller than a switchopen impedance of one of said switches and much larger than a switch-closed impedance of such switch,

means for coupling second signals having a second phase opposite to said first phase to each of said column circuits in recurring sequence, the latter signals being of sufficient amplitude after coupling through a closed one of said switches to appear on the coupled row circuit with substantially greater amplitude than do the first signals,

means for sampling row circuit signals in a recurrent sequence of said row circuits,

means for detecting a phase difference between a row circuit signal sample and said first signals, such phase difference indicating an actuated one of said switches, and

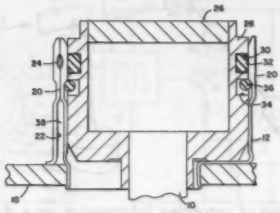
means responsive to said second signal coupling means, said sampling means, and said detecting means for producing a signal identifying said actuated switch.

4,007,460

PHASED ARRAY ELEMENT RETENTION

Jerome D. Hanfling, Framingham, and Karl L. Mengoli, Weston, both of Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 28, 1975, Ser. No. 636,002
Int. Cl.² H01Q 13/02
U.S. Cl. 343—776 **2 Claims**



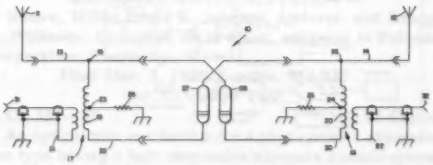
1. In a phased array structure having a plurality of radar elements disposed in parallel retained relation; each of said elements having an outer connecting end including a radiating face at its outer extremity and provided with an upper annular recess and a lower annular recess, a radial conductive O-ring seal disposed in said upper recess and a snap ring disposed in said lower recess; a retention cup carried by said structure and disposed around the element connecting end, said retention cup being provided with an annular land for sealing cooperation with said O-ring and being provided with an annular groove wherein said snap ring expands when said element is placed for retention in said cup to lock the element to the cup.

4,007,461

ANTENNA SYSTEM FOR DERIVING CARDIOD PATTERNS

Arthur Luedtke, Marietta, and William L. Kilpatrick, Austell, both of Ga., assignors to Field Operations Bureau of the Federal Communications Commission, Washington, D.C.

Filed Sept. 5, 1975, Ser. No. 610,717
Int. Cl.² H01Q 21/06
U.S. Cl. 343—844 **5 Claims**



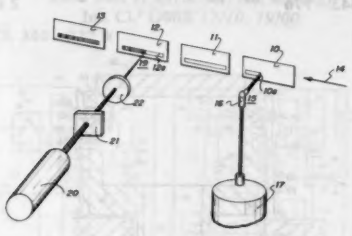
1. An isolation differential combiner comprising a left omnidirectional antenna input, a left antenna output, left transformer means having a primary and secondary winding connected therebetween, a right omnidirectional antenna input, a right antenna output, right transformer means having a primary and secondary winding connected therebetween, and each of said transformer means being centertapped for hybrid isolation between opposite ports of said primary, and delay line means crossconnecting said antenna inputs and said transformer primary means resulting in a cardioid signal pattern at said left and right antenna outputs.

4,007,462

LIGHT ABSORPTION PRINTING PROCESS

Grover C. Wetsel, Jr., Richardson, Tex., assignor to Recognition Equipment Incorporated, Dallas, Tex.

Filed Dec. 24, 1975, Ser. No. 644,104
Int. Cl.² G01D *15/34*
U.S. Cl. 346—1 **10 Claims**



1. A method of recording information on a document surface, which comprises:

a. applying a continuous coat over a field on said document of a fluorescent dye which will undergo a permanent phototransformation of the light emitting properties thereof by intense light radiation thereon; and

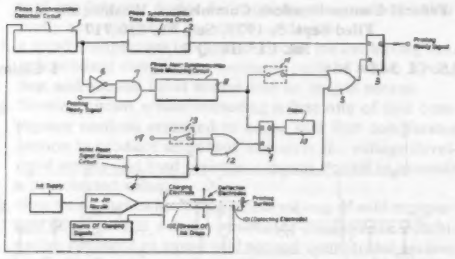
b. irradiating limited information dependent locations within said field with a light beam of intensity and wavelength required to permanently change said light emitting properties of only said dye at said locations.

4,007,463

STATE DETECTION ARRANGEMENT FOR INK JET SYSTEM PRINTER

Isao Fujimoto, Kunitachi; Takeshi Kasubuchi, and Masahiko Aiba, both of Nara, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo and Sharp Kabushiki Kaisha, Osaka, both of, Japan

Filed Mar. 12, 1974, Ser. No. 450,413
Claims priority, application Japan, Mar. 12, 1973, 48-28688
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976
Int. Cl.² G01D *18/00*
U.S. Cl. 346—75 **10 Claims**



1. A state detection arrangement used for an ink jet system printer for making a record on a writing medium by means of ink drops charged by charging signals, said arrangement comprising means for generating phase OK signals when an ink drop separating rhythm is synchronized with the phase of the charging signals, means for determining whether the phase OK signals are generated in succession for a predetermined period of time initiated upon the occurrence of a first phase OK signal, and means responsive to said determining means for generating printing ready signals when the phase OK signals are successively generated for said predetermined period;

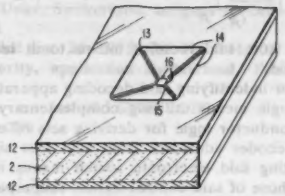
wherein the printing ready signal generating means comprises bistable switching means having input and output terminals which receives at said input terminal outputs from said determining means and produces at said output terminal the printing ready signals.

4,007,464

INK JET NOZZLE

Ernest Bassous, Riverdale; Lawrence Kuhn, Ossining; Arnold Reisman, Yorktown Heights, and Howard H. Taub, Mount Kisco, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 23, 1975, Ser. No. 543,600
Int. Cl.² G01D *15/18*
U.S. Cl. 346—75 **20 Claims**



1. In an ink jet printing system, the combination comprising:

a source of pressurized ink;

a manifold means communicating with said sources;

means for perturbing the ink at a substantially uniform frequency; and

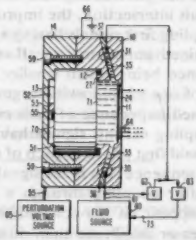
a substrate having at least one nozzle formed therein, with said one nozzle having walls formed in said substrate in the shape of a truncated pyramid, wherein the entrance and exit apertures of said one nozzle each have a rectangular cross-section coextensive with the respective faces of said substrate, with said walls each having a continuous taper extending from one face to the other face of said substrate, with said entrance aperture communicating with said manifold means for receiving ink under pressure, and with said exit aperture emitting a stream of ink which then breaks up to form ink droplets.

4,007,465

SYSTEM FOR SELF-CLEANING INK JET HEAD

Kailash Chandra Chaudhary, Los Angeles, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 17, 1975, Ser. No. 632,534
Int. Cl.² G01D *15/18*
U.S. Cl. 346—140 R **9 Claims**



1. A self-cleaning ink jet head system comprising:

a reservoir of pressurized fluid,

an orifice plate having at least one orifice therein,

a fluid dispensing manifold communicating with said fluid reservoir and with said orifice plate,

said manifold having at least two ports spaced apart,

a fluid conduit directly connected between said reservoir of fluid and one of said manifold ports,

a fluid flow controlling valve,

another fluid conduit connected in series with said valve between the other of said manifold ports, and

said reservoir of fluid, thereby urging a flow of fluid into said manifold through both of said ports when said valve is open,

another fluid flow controlling valve, and

a further fluid conduit connected in series with said other valve between said other of said conduits as connected to said other of said manifold ports and said reservoir of fluid, thereby accepting a flow of fluid from said manifold through said other of said ports and into said reservoir when said other valve is open.

4,007,466

ELECTRICAL SYSTEM HAVING A PHOTOELECTRIC CONVERTER TO BE USED IN PHOTOGRAPHY

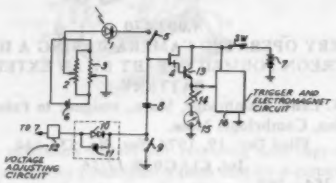
Seinan Miyakawa, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Japan

Filed Feb. 3, 1975, Ser. No. 546,563

Claims priority, application Japan, Feb. 4, 1974, 49-13656

Int. Cl.² G03B 7/08

U.S. Cl. 354—24 **9 Claims**



1. In an electrical system at least part of which is capable of determining, according to the nature of light received by the system, a factor to be utilized in the exposure of photographic film, input circuit means for providing an input signal, output circuit means for providing an output determined at least in part by said input circuit means, and intermediate circuit means electrically connected between said input and output circuit means for controlling the transmission of said input signal to said output circuit means, said input circuit means including a photoelectric conversion means for receiving light and having an open-circuit voltage which is variable depending upon the intensity of the received light for providing by way of the latter voltage at least part of said input signal so that said input signal is determined at least in part by the intensity of the light received by said photoelectric conversion means, and said intermediate circuit means cooperating with said input circuit means for providing a stabilized circuit condition where said photoelectric conversion means is in a stabilized state with no electrical current flowing therethrough, said photoelectric conversion means including a photodiode having an open-circuit voltage characteristic which varies according to a logarithmic compression depending upon the intensity of the lightreceived by said photodiode, and said photodiode having a pair of terminals one of which is electrically connected with said intermediate circuit means, a voltage source, and calculation circuit means for providing an electrical magnitude determined by a preselected diaphragm aperture and film sensitivity, said calculation circuit means being electrically connected only with said voltage source, with ground, and with the other of said pair of terminals of said photodiode, for combining said electrical magnitude with the voltage determined by said photodiode in accordance with light intensity, whereby said electrical magnitude is transmitted only through said photodiode to said intermediate circuit means with no electrical current flowing through said photodiode upon reaching said stabilized state.

4,007,467

EXPOSURE CONTROL CIRCUIT

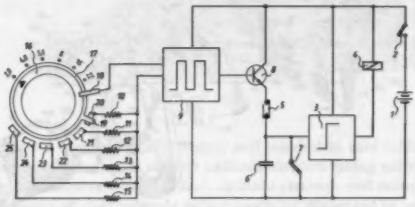
Eduard Wagensonner; Kurt Borowski, both of Aschheim, and Dieter Knauer, Munich, all of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed July 15, 1975, Ser. No. 596,054

Claims priority, application Germany, July 20, 1974, 2434995

Int. Cl.² G03B 7/08

U.S. Cl. 354—51 **6 Claims**



1. In a camera having a automatic exposure control circuit operative under a plurality of exposure factors, comprising in combination, a light-sensitive element; a capacitor; first circuit means connected to said capacitor and responsive to a start signal for changing the voltage across said capacitor from a first to a second predetermined value at a rate varying as a function of light falling on said light-sensitive element; means for furnishing said start signal at the start of the exposure time; second circuit means connected to said first circuit means for periodically interrupting the operation of the latter for a selected off-time interval corresponding to the selected one of said plurality of exposure factor, whereby the rate of change of voltage across said capacitor varies also in dependence upon said selected one of said exposure factors, said second circuit means comprise an electronic switch having a first and second stable state connected to said first circuit means for interrupting the operation thereof when in said first stable state, and pulse furnishing means connected to said electronic switch means for applying a sequence of pulses, each for switching said electronic switch means to said first stable state, to said electronic switch means, and means for changing the pulse width of the pulses in said pulse sequence to correspond to said selected one of said plurality of exposure factors; and terminating means connected to said capacitor for terminating the exposure when the voltage across said capacitor has said second predetermined value.

4,007,468

TRIM CONTROL APPARATUS FOR PHOTOGRAPHIC EXPOSURE CONTROL SYSTEM

Igor Blinow, Millis; Bruce K. Johnson, Andover, and George D. Whiteside, Lexington, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 3, 1975, Ser. No. 554,927

Int. Cl.² G03B 7/00

U.S. Cl. 354—59 **20 Claims**

1. An optical trim mechanism for a photographic apparatus of the type having a light responsive exposure control system including scene light sensing means comprising:

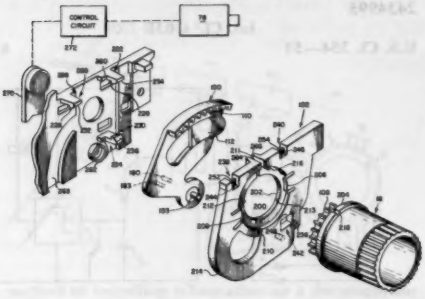
a mounting plate;

means for fixedly stationing said mounting plate with respect to the photographic apparatus;

a manually adjustable member disposed for rotation with respect to said mounting plate; and

a trim member having a light transmissive portion of varying light transmissive characteristics movable in scene light intercepting relation with respect to the scene light sensing means, said trim member being disposed for rotation with respect to said mounting plate while having a portion in engagement by a portion of said manually adjustable

member for said manually adjustable member to drive said trim member such that clockwise rotation of said adjustable member results in a corresponding clockwise rotation of said trim member while counterclockwise rotation of said adjustable member results in a corresponding counterclockwise rotation of said trim member, thereby varying the amount of scene light reaching the light sensing means in order to trim the response of the exposure control system with respect to a select amount of scene light.

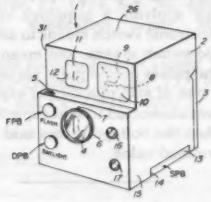


4,007,469

PHOTOGRAPHIC APPARATUS WITH PLURALITY OF SELECTIVELY DETERMINABLE OPERATIONAL MODES

Edwin H. Land, Cambridge, and Richard C. Kee, Chestnut Hill, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 21, 1975, Ser. No. 570,165
Int. Cl.² G03B 7/14, 15/03
U.S. Cl. 354—27 **20 Claims**



13. A photographic camera apparatus of the type which may be used with a source of artificial illumination; said camera comprising:

a housing having a scene light admitting aperture therethrough;

means for defining a film exposure plane within said housing;

means for blocking and unblocking the impingement of scene light on said exposure plane from said aperture to define a photographic exposure interval;

first manually operable and electrically energizable control means for providing a first signal responsive to the manual operation thereof;

second manually operable and electrically energizable control means for providing a second signal responsive to the manual operation thereof;

scene light detecting means for providing a select output signal responsive to the detection of ambient scene light above a predetermined level; and

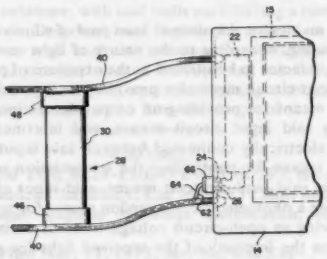
electrically energizable circuit means responsive to said first signal resulting from the manual operation of said first control means without the manual operation of said second control means in the presence of said select output signal from said scene light detecting means for actuating said scene light blocking and unblocking means to effect a photographic exposure cycle, said circuit means also being responsive to said second signal resulting from the manual operation of said second control means without the manual operation of said first control means in the absence of said select output signal from said scene light detecting means for actuating said scene light blocking and unblocking means for effecting a photographic exposure cycle while also providing a trigger signal for effecting the illumination of the source of artificial illumination during the exposure cycle, said circuit means additionally being responsive to the simultaneous occurrence of said first and second signals resulting from the simultaneous manual operation of said first and second control means for actuating said scene light blocking and unblocking means to effect a photographic exposure cycle subsequent to the expiration of a predetermined time delay after the simultaneous manual operation of said first and second control means.

4,007,470

BATTERY OPERATED CAMERA HAVING A HANDLE THEREON FORMED IN PART BY AN EXTERNAL BATTERY

Edwin H. Land, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 19, 1974, Ser. No. 534,444
Int. Cl.² G03B 17/56
U.S. Cl. 354—293 **14 Claims**



1. A battery operated camera having at least one component that is adapted to be powered by an elongated electrical battery having leading and trailing ends together with an integral casing therearound, said camera comprising:

a camera housing;

electrically conductive terminal means, electrically connected to the at least one component and to which such an electrical battery is to be electrically connected to supply power to the at least one component;

a camera carrying strap being connectable to said camera housing for facilitating carrying said camera;

means for connecting said carrying strap to said camera housing;

means on said carrying strap for respectively receiving and supporting the leading and trailing ends of such an electrical battery such that a portion of the integral battery casing intermediate the leading and trailing ends thereof forms a handle on said carrying strap when the battery is so supported; and

means for electrically connecting such a battery, when the battery is supported by said battery support means to said electrically conductive terminal means of said at least one component.

4,007,471

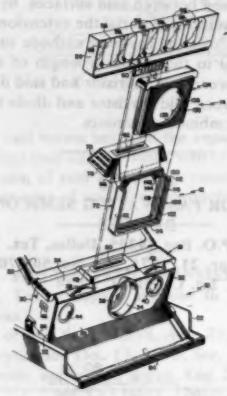
SYSTEM FOR MOUNTING PHOTOGRAPHIC ACCESSORIES ON A CAMERA

Edwin H. Land, and John B. Morse, both of Cambridge, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation of Ser. No. 300,820, Oct. 25, 1972, abandoned. This application Apr. 17, 1975, Ser. No. 568,918

Int. Cl.² G03B *11/00*

U.S. Cl. 354—295 **20 Claims**



18. An accessory holder for receiving and supporting at least one accessory other than a flash unit on a camera of the type including a housing section having a flash unit socket therein, a thin elongated opening in the housing section providing access to the flash socket, and means on the housing section for mounting an objective lens, said accessory holder comprising:

a support member;

a thin elongated coupling plug on the support member being dimensioned to be inserted through the thin elongated opening in the camera housing and into the camera flash socket therein for releasably coupling said support member to the camera;

means on said support member for receiving and supporting at least one accessory other than a flash unit and for positioning the accessory in proximity to the camera objective lens when said support member is so coupled to the camera, said receiving and supporting means including at least one open ended channel into which at least a portion of the accessory is adapted to be slideably inserted;

a flash unit socket on said support member for receiving and supporting a flash unit; and

means on said coupling plug for operatively connecting said flash unit socket on said support member to the flash unit socket of the camera when said coupling plug is inserted into the flash unit socket of the camera.

4,007,472

FLAT BATTERY WITH DRY CATHODE STRATA AND SLURRY CATHODE STRATA

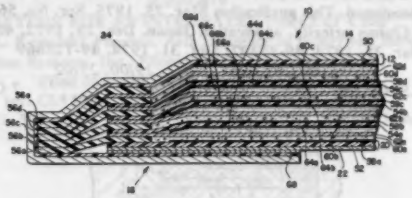
Edwin H. Land, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 495,628, Aug. 8, 1974, abandoned. This application Jan. 8, 1976, Ser. No. 647,590

Int. Cl.² H01M *6/46*

U.S. Cl. 429—153 **18 Claims**

1. A planar primary battery having at least one cell, said cell comprising an anode, a cathode and a planar electrolyte ion permeable separator positioned between said anode and said cathode; said cathode comprising a planar cathode current collector carrying on one surface thereof, in order, a first cathode stratum and a second cathode stratum; said first cathode stratum being of the "dry patch" cathode type and comprising a particulate dispersion of cathode active particles in a binder matrix, said binder matrix being insoluble in but



permeable to aqueous electrolyte and bonded to said cathode current collector; said second cathode stratum being substantially coextensive with said first cathode stratum and comprising a slurry of said cathode active particles dispersed in aqueous electrolyte and adhered to said first cathode stratum, the cathode particles in said first and second cathode strata being the same.

4,007,473

TARGET STRUCTURES FOR USE IN PHOTOCONDUCTIVE IMAGE PICKUP TUBES AND METHOD OF MANUFACTURING THE SAME

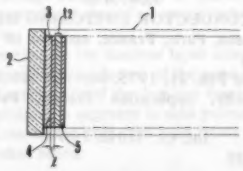
Yasuhiko Nonaka, Mobara; Tadaaki Hirai, Koganei; Naohiro Goto, Machida, and Keiichi Shidara, Tama, all of Japan, assignors to Hitachi, Ltd. and Nippon Hoso Kyokai, both of Tokyo, Japan

Filed May 23, 1975, Ser. No. 580,539

Claims priority, application Japan, June 21, 1974, 49-70213

Int. Cl.² H01L *27/14*

U.S. Cl. 357—31 **17 Claims**



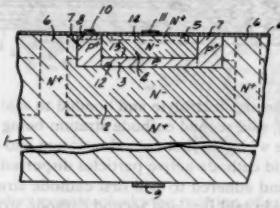
1. In a target structure for use in a photoconductive image pickup tube of the type comprising a transparent substrate, an N-type transparent conductive film deposited on the rear side of said substrate, and a P-type photoconductive film deposited on the rear side of N-type transparent conductive film with a heterojunction surface therebetween and said P-type photoconductive film containing at least selenium and tellurium as an intensifier, the improvement wherein the starting point of the intensifier containing portion of said P-type photoconductive film is located in a predetermined range of 80A to 1500A spaced in the direction of thickness thereof from said heterojunction surface.

4,007,474

TRANSISTOR HAVING AN EMITTER WITH A LOW IMPURITY CONCENTRATION PORTION AND A HIGH IMPURITY CONCENTRATION PORTION

Hajime Yagi, Tokyo, and Tadaharu Tsuyuki, Isehara, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 427,648, Dec. 26, 1973, abandoned. This application Mar. 25, 1975, Ser. No. 561,914
Claims priority, application Japan, Dec. 29, 1972, 48-550; Mar. 28, 1974, 49-35307; Oct. 31, 1974, 49-125869
Int. Cl.² H01L 29/72, 29/00, 27/02
U.S. Cl. 357—34 7 Claims



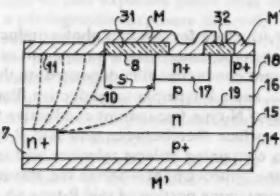
1. A semiconductor device comprising:
a. a first semiconductor region of a first conductivity type;
b. a second semiconductor region of the opposite conductivity type interfaced with said first region, and forming a first PN junction therewith;
c. a third semiconductor region of said first conductivity type interfaced with said second region and forming a second PN junction therewith lying on the opposite side of said second region from said first region;
d. means for forwardly biasing said first PN junction and transporting majority carriers in said first region to said third region;
e. said first region having a lightly doped portion adjacent to said first PN junction and a heavily doped portion forming a third junction between said lightly doped portion and said heavily doped portion;
f. said third junction being situated from said first PN junction by a distance less than the diffusion length of minority carriers in said lightly doped portion; and
g. the impurity concentration and gradient at said third junction being selected to have an electric field such that a drift current of minority carriers produced thereby substantially balances a diffusion current of minority carriers injected from said first PN junction.

4,007,475

SEMICONDUCTOR SWITCHING DEVICE

Yoland Collumeau, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Feb. 21, 1975, Ser. No. 551,856
Claims priority, application France, Feb. 22, 1974, 74.06205
Int. Cl.² H01L 29/747
U.S. Cl. 357—39 5 Claims



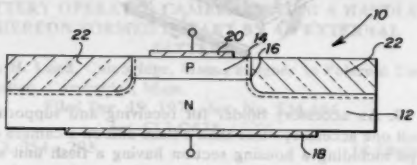
1. A solid-state switching, device, constituted by a thyristor and a diode integrated into two parts of one and the same monocrystalline semi-conductor block which has two opposite principal faces, the anode (14) of the thyristor and the cathode (7) of the diode extending up to one of said faces where they are electrically connected, the gate of the thyristor extending up to the other of said faces (16) (18) as also do the anode (11) of the diode and the cathode (17) of the thyristor whose two respective surfaces are unbroken and electrically linked by a conductive connecting layer (M) carried by said other face, device wherein said conductive connecting layer is separated from the face which carries it, at least over the portion (8) comprised between said surfaces, by a layer (31) of an electrically insulating material the extension of said layer on said other face, from the thyristor cathode surface region, being at least equal to the diffusion length of the electrical charge carriers between said thyristor and said diode regions, and the region between said thyristor and diode regions being without added recombination centers.

4,007,476

TECHNIQUE FOR PASSIVATING SEMICONDUCTOR DEVICES

Jearld L. Hutson, P.O. Box 34235, Dallas, Tex. 75234

Filed Apr. 21, 1975, Ser. No. 569,704
Int. Cl.² H01L 29/34
U.S. Cl. 357—52 9 Claims



1. In a semiconductor device, the combination comprising:
a body of semiconductor material having layers of opposite semiconductor conductivity type forming at least one P-N junction,
a region of glass doped with carrier lifetime degrading material selected from gold and platinum contacting said P-N junction, wherein the voltage capacity and stability of said P-N junction is enhanced.

4,007,477

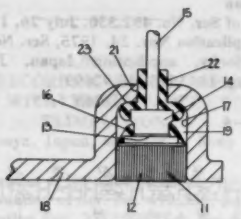
ASSEMBLY OF A RECESSED HEAT SINK AND A SEMICONDUCTOR DEVICE SEALED WITHIN THE RECESS IN THE HEAT SINK AND THERMALLY CONNECTED TO THE HEAT SINK

Dennis George Goodman, Birmingham, England, assignor to The Lucas Electrical Company Limited, Birmingham, England

Filed Dec. 30, 1974, Ser. No. 537,337
Claims priority, application United Kingdom, Jan. 18, 1974, 2391/74
Int. Cl.² H01L 23/28, 23/02, 23/12, 23/42
U.S. Cl. 357—81 3 Claims

1. A semi-conductor assembly including a conductive stud, a semi-conductor device, a first contact area of said device being thermally and electrically connected to said stud, and electrical lead including an expanded head portion, said head portion being thermally and electrically connected to a second contact area of said device, a single body of thermally conductive material forming a heat sink and provided with a cup-shaped recess portion having a bottom wall portion and an aperture through said bottom wall portion, said recessed portion receiving said conductive stud in thermal engagement therewith to close the open end of said recess, said electrical lead passing through said aperture in said recess, sealing sleeve means of insulating material passing through said aper-

ture and disposed between said electrical lead and said aperture to prevent ingress of foreign material into said recess through said aperture, and deformable resilient means disposed within said recess between the expanded head portion of said electrical lead and the inner wall of said recess to urge the head portion of said lead into pressure contact with the second contact area of said semi-conductor device.

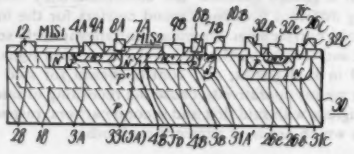


4,007,478

FIELD EFFECT TRANSISTOR

Hajime Yagi, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 282,898, Aug. 23, 1972, abandoned. This application Oct. 17, 1973, Ser. No. 407,285
Claims priority, application Japan, Aug. 26, 1971, 46-65271
Int. Cl.² H01L *27/02*
U.S. Cl. 357—41 **6 Claims**



1. An MIS field effect transistor comprising:

a body of semiconductor material including

a. a first region of semiconductor material of one conductivity type extending to a surface of said body;

b. a second region of semiconductor material of the same type conductivity as that of said first region and extending to said surface and being spaced laterally from said first region;

c. a single substantially cup-shaped region only of semiconductor material of the opposite type conductivity to that of said first and second regions, said cup-shaped region containing said second region and having a portion located between said first and second regions and forming at least one PN junction therewith, said portion of the cup-shaped region of semiconductor material extending to said surface of the semiconductor body to provide a narrow channel; and

d. a buried region of semiconductor material of the opposite conductivity type having a greater impurity concentration than that of said cup-shaped region and being at least substantially laterally coextensive with, and located in underlying relation to said cup-shaped region and in contact therewith over substantially the entire lateral extent of the latter, said buried region being spaced laterally from said first region with the margin of said buried region which is closest to said first region being spaced from said first region in the lateral direction toward said cup-shaped region;

e. first and second electrodes respectively connected to said first and second regions at said surface;

f. a control electrode electrically insulated from the semiconductor body and being positioned substantially over the entire area of said portion of said cup-shaped region extending to the surface of said body; and

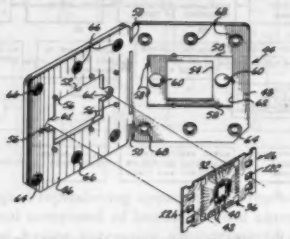
g. means to apply a potential to said cup-shaped region through said buried region from the outside of said semiconductor body.

4,007,479

FIXTURE FOR AN INTEGRATED CIRCUIT CHIP

John L. Kowalski, Phoenix, Ariz., assignor to Honeywell Information Systems, Inc., Phoenix, Ariz.

Filed Mar. 29, 1976, Ser. No. 671,238
Int. Cl.² H01L *23/48;* **H02B** *1/04;* **H01R** *13/50*
U.S. Cl. 357—70 **22 Claims**



1. A fixture for a segment of a film strip, said segment having a lead frame affixed to the segment and an integrated circuit chip bonded to the lead frame,

said segment having reference sprocket holes formed therein,

a window formed in each segment, the window having a predetermined position relative to the reference sprocket holes,

the lead frame having a plurality of electrically distinct leads, each lead having outer portions and inner portions, the outer portion of each of the leads being secured to the segment and the inner portion of each lead extending over the window, the leads having a predetermined position relative to the reference sprocket holes, and

the integrated circuit chip being bonded to inner portions of leads of the lead frame, and being positioned in the window;

said fixture comprising:

a laminar layer, an aperture in said layer, the dimensions of the aperture being substantially equal to or greater than the dimensions of the window in said segment but substantially less than the dimensions of said segment;

means forming access openings formed in said fixture, said access openings being located to permit access to the reference sprocket holes of a segment when positioned in said fixture;

positioning means on the laminar layer adapted to position a segment so that the window of the segment is accessible through the aperture of the laminar layer; and

means for retaining a segment in said position and for providing access to the chip, the lead frame, and the reference sprocket holes.

4,007,480

COLOR TELEVISION RECEIVER BEAT FREQUENCY CONTROL USING STABILIZED TELEVISION TRANSMITTER AURAL CARRIER

Dale Wolters, Grandville, Mich., assignor to West Michigan Telecasters Inc., Grand Rapids, Mich.

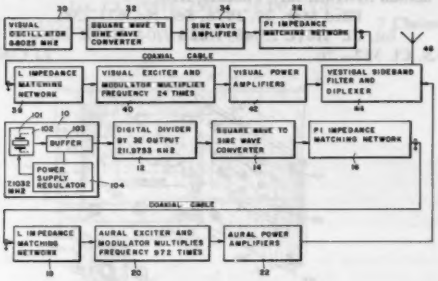
Filed Sept. 17, 1975, Ser. No. 614,304
Int. Cl.² H04N *9/02*
U.S. Cl. 358—1 **6 Claims**

1. In combination with a color television transmitter, an aural carrier frequency generating device, for generating the aural carrier of said color television transmitter, comprising:

a proportionally controlled oven;

an "AT" cut crystal oscillator housed in said oven having a frequency of from about 1MHz to 10MHz, including means for generating a square wave signal and converting the square wave signal to a sine wave signal of the same frequency;

a frequency dividing network whereby the output of the oscillator is divided by an amount equal to the factor by which the frequency produced by the crystal oscillator is greater than the frequency desired for aural modulation,


VISUAL OSCILLATOR 54.025 MHZ
SQUARE WAVE TO SINE WAVE CONVERTER
SINE WAVE AMPLIFIER
PI IMPEDANCE MATCHING NETWORK
COAXIAL CABLE
L IMPEDANCE MATCHING NETWORK
VISUAL EXCITER AND MODULATOR MULTIPLIES FREQUENCY 24 TIMES
VISUAL POWER AMPLIFIERS
VESTIGIAL SIDEBAND FILTER AND DIPLEXER
BUFFER
POWER SUPPLY REGULATOR
DIGITAL DIVIDER BY 30 OUTPUT 211.9793 KHZ
SQUARE WAVE TO SINE WAVE CONVERTER
PI IMPEDANCE MATCHING NETWORK
COAXIAL CABLE
L IMPEDANCE MATCHING NETWORK
AURAL EXCITER AND MODULATOR MULTIPLIES FREQUENCY 972 TIMES
AURAL POWER AMPLIFIERS

thereby reducing frequency variations in the aural carrier to substantially eliminate frequency variations in the best frequency in a color television receiver between the aural carrier and a signal of another frequency; and

a frequency multiplying means coupled to said frequency dividing network for multiplying the output of said frequency dividing network so the frequency output of said multiplying means falls within the 54 to 88 MHz or 174 to 216 MHz television broadcast frequencies.

4,007,481

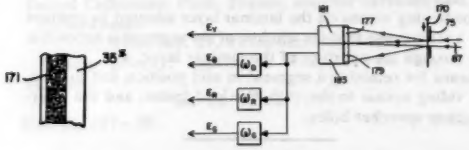
HOLOGRAPHIC COLOR TELEVISION RECORD

Daniel S. St. John, Hockessin, Del., assignor to Holotron Corporation, Wilmington, Del.

Division of Ser. No. 454,923, March 26, 1974, Pat. No. 3,900,884, which is a division of Ser. No. 884,078, Dec. 11, 1969, Pat. No. 3,813,685. This application May 16, 1975, Ser. No. 578,093

Int. Cl.² H04N *9/02*

U.S. Cl. 358—2 **2 Claims**



1. A holographic record, comprising an elongated flexible film record member having a plurality of individual holograms constructed along its length in a touching relationship, each of said holograms containing a distinct piece of full color information that may be reconstructed with a single monochromatic spatially coherent light beam in a manner to form two spatially separated monochromatic images, one image corresponding to a luminance component and the other image corresponding to a color component of said distinct piece of full color information.

4,007,482

MAGNETIC RECORDING AND/OR REPRODUCING APPARATUS

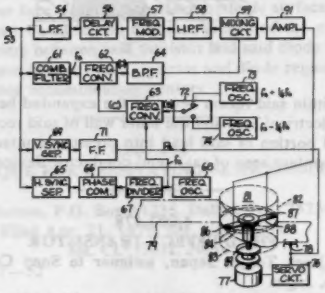
Shinji Amari, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 492,330, July 26, 1974, abandoned. This application Nov. 24, 1975, Ser. No. 634,668

Claims priority, application Japan, July 31, 1973, 48-86111; Aug. 18, 1973, 48-92699

Int. Cl.² H04N *5/79*

U.S. Cl. 358—4 **55 Claims**



1. In apparatus for recording periodic information signals comprised of first intervals and predetermined numbers of second intervals included in each of said first intervals and which are recorded in respective areas of successive parallel tracks on a record medium the combination of means for providing different first and second carriers for the information signals; carrier selecting means for alternatively selecting said first and second carriers for said information signals to be recorded in said tracks; and control means for said carrier selecting means operative to cause the recording of said information signals with said first and second carriers, respectively, in tracks which are next adjacent each other.

4,007,483

CIRCUIT FOR PROCESSING A COLOR TELEVISION SIGNAL PRIOR TO MAGNETIC RECORDING AND CORRESPONDING RESTORING CIRCUIT

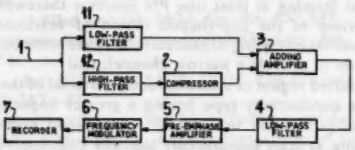
Luc Pham van Cang, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Dec. 22, 1975, Ser. No. 643,038

Claims priority, application France, Dec. 24, 1974, 74.42637

Int. Cl.² H04N *5/785*

U.S. Cl. 358—4 **4 Claims**



1. A circuit for processing a composite color television signal prior to the magnetic recording thereof, said circuit comprising: filtering means for splitting said signal into two adjacent frequency bands, comprising a lower frequency band, and a higher frequency band including the chrominance sub-carrier, said filtering means having first and second outputs for respectively delivering said lower and higher frequency bands; amplitude compressor means having an input coupled to said second output, and an output; an adder having two inputs respectively coupled to said first output and to said

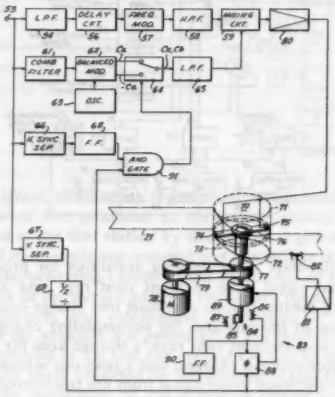
compressor means output, and an output; a pre-emphasis device having an input coupled to said adder output, and an output; and a frequency modulator having an input coupled to said output of said pre-emphasis device.

4,007,484

MAGNETIC RECORDING AND/OR REPRODUCING APPARATUS WITH CHROMINANCE CROSSTALK ELIMINATION

Shinji Amari, Hooya, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 634,668, Nov. 24, 1975, which is a continuation of Ser. No. 492,330, July 26, 1974.
This application Dec. 23, 1975, Ser. No. 643,639
Claims priority, application Japan, July 31, 1973, 48-86111; Aug. 18, 1973, 48-92699
Int. Cl.² H04N 5/79
U.S. Cl. 358—8 **25 Claims**



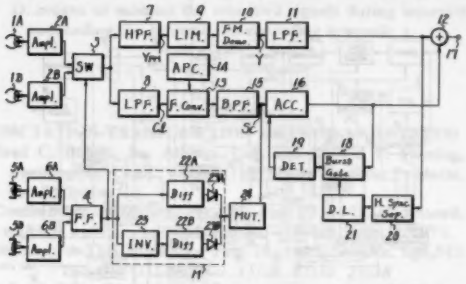
1. In apparatus for recording video signals having luminance and chrominance signal components and being comprised of field intervals and line intervals recorded in respective areas of successive parallel tracks on a record medium: the combination of a plurality of transducers which are movable with respect to the record medium so as to be successively operatively positioned relative to said record medium in a repeating cyclic order for recording the video signals in said successive tracks, respectively; pulse signal generating means for producing pulse signals upon the operative positioning of each of said transducers; means for providing different first and second carriers for said chrominance signal components; carrier selecting means for alternatively selecting said first and second carriers for said chrominance signal components to be recorded in said tracks; control means for said carrier selecting means operative in response to every other one of said pulse signals to cause the recording to said chrominance signal components with said first and second carriers, respectively, in tracks which are adjacent each other; means for separating vertical synchronizing signals from the video signals being recorded; means receiving the separated vertical synchronizing signals for producing control signals at a repetition rate which is a fraction of the repetition rate of said vertical synchronizing signals, said fraction being 1/(2xn) in which n is the number of said field intervals to be recorded in each of said tracks; means for recording said control signals on the record medium in predetermined positional relation to said tracks so as to distinguish the tracks in which the chrominance signal components are recorded with said first and second carriers, respectively; and means for regulating the movement of said transducers in dependence on a comparison of said every other one of said pulse signals with said control signals.

4,007,485

COLOR VIDEO SIGNAL REPRODUCING APPARATUS

Nobuaki Sato, Atsugi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 31, 1975, Ser. No. 563,517
Claims priority, application Japan, Apr. 8, 1974, 49-39686
Int. Cl.² H04N 5/795, 9/535
U.S. Cl. 358—8 **8 Claims**



1. A video signal reproducing apparatus for reproducing a color video signal composed of luminance and chrominance components and having successive predetermined intervals which are respectively recorded in successive tracks extending parallel to one another on a record medium comprising:

a. at least two signal reproducing means which alternately scan the successive record tracks for reproducing the intervals of the color video signal respectively recorded therein;

b. switching means for alternately switching said two signal reproducing means to provide in succession the intervals of the color video signal reproduced from said successive record tracks;

c. an input terminal to which the chrominance components of said successive intervals of the reproduced color video signal are supplied from said signal reproducing means by way of said switching means;

d. an output terminal from which a gain controlled chrominance component of the color video signal is derived;

e. an automatic gain control circuit connected between said input and output terminals;

f. level detecting means for detecting the output level of said automatic gain control circuit and providing a corresponding control signal output which is fed back to said automatic gain control circuit; and

g. muting means for preventing the operation of said level detecting means for a predetermined period at the commencement of each said interval of said reproduced color video signal and by which the operation of said automatic gain control circuit is arrested for said predetermined period.

4,007,486

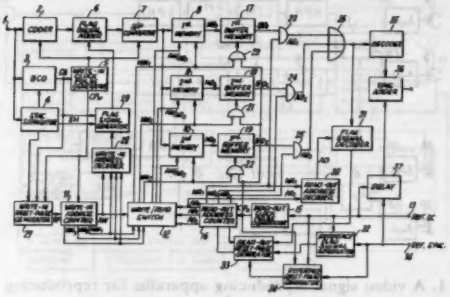
PHASE LOCKING SYSTEM FOR TELEVISION SIGNALS USING A DIGITAL MEMORY TECHNIQUE

Masao Inaba; Atsumi Sugimoto; Mikio Shimizu; Masashi Onosato; Shigeru Miyahara, and Kazuo Kashigi, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Sept. 30, 1975, Ser. No. 618,276
Claims priority, application Japan, Oct. 5, 1974, 49-115406; Oct. 15, 1974, 49-119024
Int. Cl.² H04N 9/46
U.S. Cl. 358—13 **13 Claims**

11. In combination in a video phase locking system for phase locking at least one incoming, first, composite NTSC video signal including video information and first synchronization signals including horizontal and vertical signals and a color subcarrier, to second, reference, NTSC synchronization signals, said system including memory means for storing one

field of the incoming video information, inputting clock addressing and encoding means responsive to the first synchronizing signals for digitally encoding said incoming video information and storing said information in said memory means, outputting clock and addressing means responsive to the second, reference synchronizing signals for reading out said digitally quantized video signal on a frame-by-frame basis from said memory means, said inputting clock, addressing snd

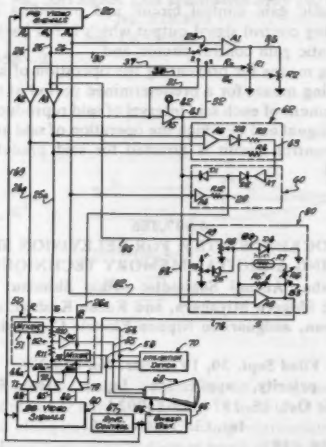


encoding means including means for storing a flag signal marking the place of each stored incoming video signal frame on a repeating sequence basis, and wherein said outputting clock and addressing means includes means for generating a flag signal characterizing outputting frames on a repeating sequence basis, and means responsive to the values of a read-out stored flag and of an outputting frame flag signal for selectively skipping storage locations in said memory means during memory interrogation.

4,007,487
ELECTRONIC COMPOSITE PHOTOGRAPHY WITH COLOR CONTROL

Petro Vlahos, Tarzana, Calif., assignor to The Association of Motion Picture and Television Producers Inc., Hollywood, Calif.

Filed Sept. 25, 1975, Ser. No. 616,685
Int. Cl.² H04N *9/535*
U.S. Cl. 358—22 **27 Claims**



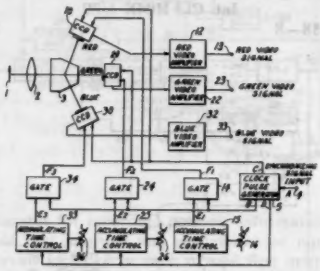
1. In combination with an electronic system for producing a composite color picture from foreground and background video signals, the foreground signals representing respective color components of a foreground scene having areas of different effective transparency against a backing effectively illuminated with light which is predominantly confined to one of said colors and which contains an impurity of at least one other color; the improvement comprising

means for substantially compensating said color impurity throughout a continuous range of said transparency.

4,007,488
SOLID-STATE COLOR IMAGING APPARATUS HAVING CHARGE-COUPLED DEVICES

Masanobu Morishita; Hidehiko Inoue, and Mitsuru Kawasaki, Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Feb. 6, 1976, Ser. No. 656,007
Claims priority, application Japan, Feb. 7, 1975, 50-16111; Oct. 27, 1975, 50-129151
Int. Cl.² H04N *9/04, 9/535, 3/14*
U.S. Cl. 358—29 **5 Claims**



1. A solid-state color imaging apparatus for producing a color video signal from incident light rays said apparatus comprising means including at least one charge-coupled device having an imaging area for accumulating charges in response to said incident light rays, a storage area for transferring the accumulated charges, and a read-out means for producing an electrical video signal from the transferred charges for producing a video signal;

means for producing first and second driving pulses in response to a synchronizing signal, said first driving pulse setting a time period during which said charges are accumulated in said imaging area and said second driving pulse causing said charge transfer; and,

means operatively connected to said first driving pulse producing means for controlling said time period of said first driving pulse.

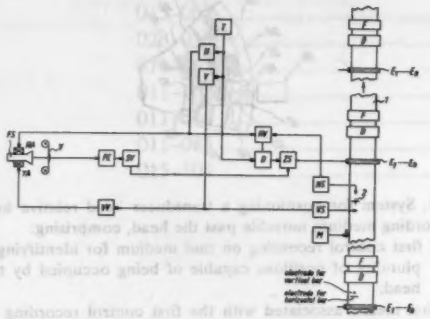
4,007,489
METHOD AND APPARATUS FOR CREATING COLOR COPIES OF AN ORIGINAL BY AN ELECTROSTATIC CHARGING PROCESS

Josef Helmberger, and Wo'fgang Ruf, both of Munich, Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed Sept. 19, 1975, Ser. No. 614,786
Claims priority, application Germany, Sept. 24, 1974, 2445541
Int. Cl.² H04N *1/46, 1/30*
U.S. Cl. 358—78 **12 Claims**

1. In a method of forming a color image composed of at least three superimposed component images of different respective colors, in combination, the steps of transporting printing material along a predetermined path past at least three spaced successive printing stations, each printing station including a row of printing electrodes extending perpendicular to the printing material transport direction and operable for forming a latent image of a row of points corresponding to the row of electrodes, each printing station including means for converting the respective latent image into a corresponding visible component image of a respective color; scanning a line

on a color original progressively proceeding from one end of the line to the other and generating for such line a first, a second and a third group of scanning signals indicative of the density of successive points of the progressively scanned line with respect to a first, a second and a third component color of the color original; at each printing station applying to the electrodes of the row of printing electrodes a group of activating signals corresponding to a respective one of said first, second and third groups of scanning signals and causing the electrodes of the row of printing electrodes to simultaneously with one another form upon the printing material a latent point image of a line corresponding to the line scanned on the



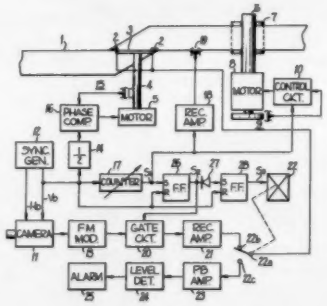
color original; establishing registration of the point image of the scanned line produced at the second station with that produced at the first station by detecting a registration mark provided on the printing material and controlling the application of the activating signals to the electrodes of the row of electrodes at the second printing station in dependence upon such detection; and establishing registration of the point image of the scanned line produced at the third station with those produced at the first and second stations by detecting a registration mark provided on the printing material and controlling the application of the activating signals to the electrodes of the row of electrodes at the third printing station in dependence upon such detection.

4,007,490

TIME LAPSE VIDEO TAPE RECORDER

Hiroshi Shoda, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed July 30, 1975, Ser. No. 600,212
Claims priority, application Japan, Aug. 7, 1974, 49-89899
Int. Cl.² H04N *5/78*
U.S. Cl. 360—11 **7 Claims**



1. A time lapse video tape recorder comprising:

A. magnetic transducer means moving at a predetermined speed;

B. means for selecting certain video image signals of a succession of said signals and for recording only said certain signals on said medium during intermittent recording intervals;

C. means for moving a recording medium past said transducer means at an average rate of speed too low to record all of said video image signals on said medium; and

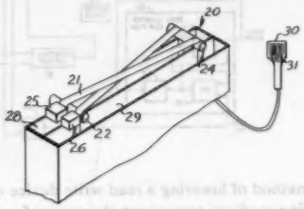
D. means to monitor the recorded signals during intervals succeeding the intermittent recording intervals.

4,007,491

DICTATION-TRANSCRIPTION METHOD AND SYSTEM

Fred C. Bolick, Jr., Atlanta, Ga., and Ronald F. Fleming, Farmington, Conn., assignors to Lanier Business Products, Inc., Atlanta, Ga.

Continuation of Ser. No. 391,685, Aug. 27, 1973, abandoned, which is a continuation of Ser. No. 149,480, June 3, 1971, abandoned. This application Feb. 10, 1975, Ser. No. 548,543
Int. Cl.² G11B *15/06, 15/18, 27/30, 23/38*
U.S. Cl. 360—74 **30 Claims**



1. System for recording and subsequently transcribing dictation on a recording medium, comprising:

movement means selectively operative to move a recording medium in either a first direction or a second direction;

first record means operative to record dictated material on the recording medium as the recording medium is moved in a first direction by said movement means;

second record means selectively operative to record indexing signals on the recording medium distinguishable from the recorded dictated material as the recording medium undergoes said first direction movement;

transcribe means operative in response to such recorded dictated material on the recording medium to reproduce the dictated material as the recording medium is moved in the first direction;

indexing signal means operative in response to an indexing signal recorded on the recording medium to provide an indexing signal condition as the recording medium is moved in a selected direction;

dictate control means connected to said movement means and to said first record means and operative to command movement of the recording medium in the first direction and to command operation of said first record means;

indexing control means connected to said movement means and to said indexing signal means and selectively operative to command movement of the recording medium in either of said directions and to command operation of said indexing signal means;

said indexing control means includes movement stop means responsive to the occurrence of said indexing signal condition to terminate said commanded movement of the recording medium only when said indexing control means is commanding movement of the recording medium in a certain one of said directions; and

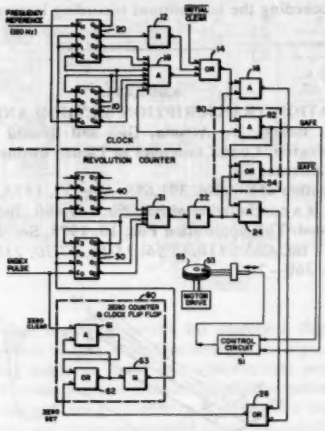
transcribe control means connected to said movement means and operative to command movement of the recording medium in the first direction and to command operation of said transcribe means.

4,007,492

ROTATIONAL SPEED MONITOR

Andrew M. Rose, Pittsburgh, Pa., assignor to Sperry Rand Corporation, New York, N.Y.

Division of Ser. No. 449,165, March 7, 1974, Pat. No. 3,900,796. This application Apr. 4, 1975, Ser. No. 565,184
Int. Cl.² G11B *21/12, 15/46, 19/02;* G01B *3/56*
U.S. Cl. 360—75 2 Claims



1. The method of lowering a read-write device onto a rotating recording medium comprising the steps of,

a. generating a first threshold value comprising two separated rotational speeds,

said read-write device being brought into juxtaposition with said recording medium when the medium's rotational speed reaches said threshold;

b. switching to a second threshold value comprising two separated rotational speeds upon reaching said first threshold,

the second threshold value being lower than the first threshold value,

said switching from a first to a second threshold preventing the in and out movement of said read-write device with respect to said recording medium.

4,007,493

TRACK POSITIONING SYSTEM FOR MAGNETIC TRANSDUCER HEAD

Michael Isaac Behr, South Pasadena; Norman Stephen Blessum, Thousand Oaks, and Wilfred Dean Iwan, Sierra Madre, all of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed May 6, 1975, Ser. No. 574,872
Int. Cl.² G11B *21/10*
U.S. Cl. 360—77 13 Claims

1. System for positioning a transducer head relative to a recording medium movable past the head, comprising:

a first control recording on said medium for identifying a plurality of positions capable of being occupied by the head;

first means associated with the first control recording to provide a series of pulses corresponding to said first recording;

a second control recording on said medium for identifying a particular position of said plurality of positions;

said first and second recordings extending in parallelism, circumferentially on said medium, and said first recording comprising a plurality of magnetic transitions extending at a first angle to the direction of motion of said medium, and said second recording comprising a single magnetic transition oriented at a second angle to the direction of motion of said medium;

second means associated with the second control recording to provide a single pulse corresponding to said second recording;

a circuit connected to said first and second means for providing a signal corresponding to the deviation of the position of the head from a desired position; and

means connected to said circuit and capable of energizing the head for movement thereof in response to said signal.

DESIGN PATENTS

GRANTED FEBRUARY 8, 1977

ERRATA

For CLASS	See PATENT NO.
015–053	243,311
023–058	243,325
011–152	243,357
011–152	243,358
011–004	243,359
011–083	243,360
015–104	243,362

DESIGN PATENTS

GRANTED FEBRUARY 8, 1977

ERRATA

CLASS	PATENT NO.
015-052	
023-054	
014-172	
011-152	
011-004	
011-083	
015-104	

DESIGNS

FEBRUARY 8, 1977

243,291

POCKET FOR TROUSERS OR THE LIKE

David Mechaly, Allee de Pins, Immeubles "L'Emeraude", chemin du Redon, 13609 Marseille, and Jean-Claude Gillard, Lotissement Barqueroute, Allee 5, 13620 Carry-Le-Rouet, both of France

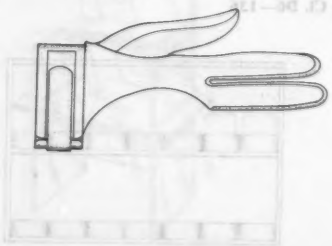
Filed May 5, 1975, Ser. No. 574,711
Claims priority, application France, Nov. 5, 1974, 74.4178
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—25

243,292

GLOVE FOR POOL, BILLIARDS, OR THE LIKE

Elmer C. Koehler, 26512 Calle San Francisco, San Juan Capistrano, Calif. 92675

Filed Feb. 7, 1975, Ser. No. 548,085
Term of patent 14 years
Int. Cl. D2—*06*
U.S. Cl. D2—361

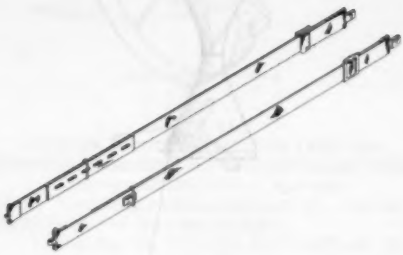


243,293

ADJUSTABLE SUSPENDER

Horatio Scheimberg, 5636 Melrose Ave., Los Angeles, Calif. 90038

Filed Mar. 12, 1975, Ser. No. 557,600
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—404

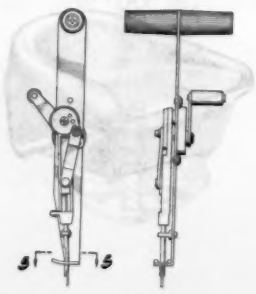


243,294

HAND POWERED TUFTING MACHINE

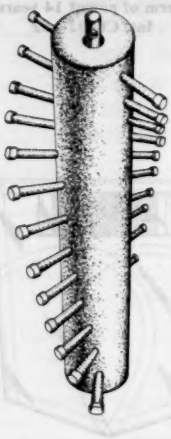
Fred A. Thaheld, and Fred H. Thaheld, both of Minden, Nev., assignors to Rumplestiltskin's Craft Shop, Inc.

Filed June 25, 1975, Ser. No. 590,323
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D3—19 R

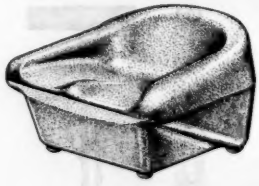


243,295
PEDESTAL BASE
George J. Hartinger, 3906 Thomas Ave. North, Minneapolis, Minn. 55412
Filed June 16, 1975, Ser. No. 586,885
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—26

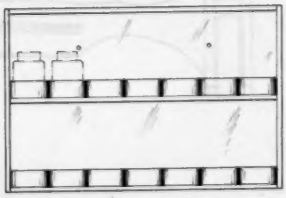
243,297
HANGING RACK
Joseph N. Vizzard, 16041 Greenwood Road, Monte Sereno, Calif. 95030
Filed Dec. 22, 1975, Ser. No. 642,769
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—113



243,296
CHAIR
Marten Gottsegen, 1212 Lake Shore Drive, Chicago, Ill. 60610
Filed June 30, 1975, Ser. No. 591,417
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—71

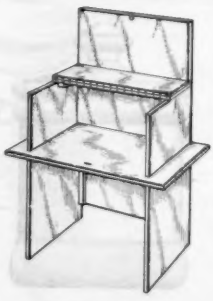


243,298
RACK FOR SPICE CONTAINERS
Gayle A. Taubman, 40 Central Park South, Apt. 4D, Wing 41, New York, N.Y. 10019
Filed Dec. 12, 1975, Ser. No. 639,999
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—136



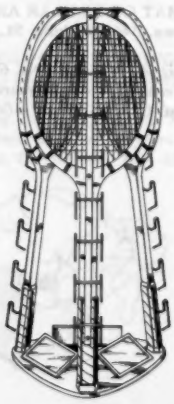
243,299
END TABLE
Ralph Jackson, 4815 Texas Ave. SE. No. 402, Washington, D.C. 20019
Filed Sept. 30, 1975, Ser. No. 617,422
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—148

243,300
WORK BENCH FOR A FRUIT AND VEGETABLE GRADER
Grover N. Christensen, 18763 Casa Blanca Lane, Saratoga, Calif. 95070
Filed Oct. 2, 1975, Ser. No. 618,788
Term of patent 3.5 years
Int. Cl. D6—*03*
U.S. Cl. D6—150

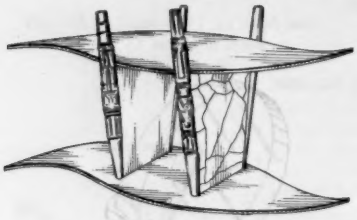


243,301
CHEVAL-GLASS
Ole Stig Ravn, Farum, Denmark, assignor to Stig Ravn A/S, Farum, Denmark
Filed Apr. 30, 1975, Ser. No. 573,302
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—235

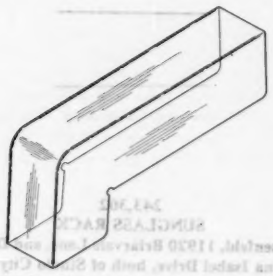
243,302
SUNGLASS RACK
George Weisenfeld, 11920 Briarvale Lane, and David Halpern, 11301 Dona Isabel Drive, both of Studio City, Calif. 91604
Filed Oct. 23, 1975, Ser. No. 625,268
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—151



243,303
COCKTAIL TABLE
Ralph Jackson, 4815 Texas Ave., SE., No. 402, Washington, D.C. 20019
Filed Sept. 30, 1975, Ser. No. 617,421
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—177

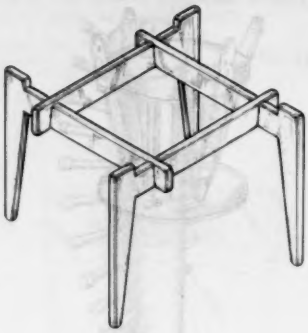


243,304
ARMREST COVER OR SIMILAR ARTICLE
Robert S. Fuqua, 1530 Glenhurst, Wichita, Kans. 67212
Filed Sept. 2, 1975, Ser. No. 609,424
Term of patent 7 years
Int. Cl. D6—*13*
U.S. Cl. D6—269

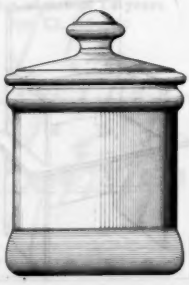


243,305
PLACEMAT OR SIMILAR ARTICLE
Gary K. Kobashikawa, 3460 Maluhia St., Honolulu, Hawaii 96816
Filed Aug. 4, 1975, Ser. No. 601,535
Term of patent 14 years
Int. Cl. D6—*13*; D7—*06*
U.S. Cl. D6—271

243,306
KNOCKDOWN FURNITURE BASE OR SIMILAR ARTICLE
John W. Moyer, 2342 Jackson St., Fremont, Calif. 94538
Filed June 6, 1975, Ser. No. 584,386
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191

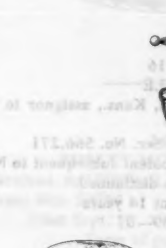


243,307
CANISTER
Dominick Loscalzo, New York, N.Y., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed May 5, 1975, Ser. No. 574,783
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D7—79

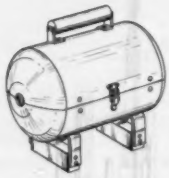


243,308
COFFEEMAKER OR THE LIKE
Wolfgang Harms, 209 Harvest Rd., and Karl H. Bergmann, 12 Plymouth Drive, both of Cherry Hill, N.J. 08034
Filed Apr. 16, 1975, Ser. No. 568,391
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—85

243,309
GRILL
Kosti Reunanen, Kodiksami, Finland, assignor to Reunanen & Roviola Oy, Finland
Filed July 23, 1975, Ser. No. 598,149
Claims priority, application Finland, Jan. 23, 1975, 7530
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—107

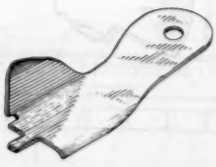


243,310
BARBEQUE
Carol Lee Heberling, 10890 Loma Vista, Ventura, Calif. 93003
Filed Mar. 1, 1976, Ser. No. 662,324
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—110

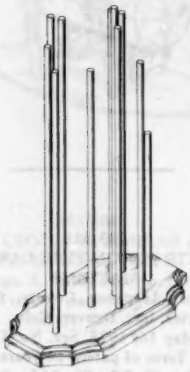


243,311
HOT WATER EXTRACTION-TYPE CARPET CLEANING MACHINE
Robert N. Bartlett, Arapahoe County, Colo., assignor to Windsor Industries, Inc., Denver, Colo.
Filed May 16, 1975, Ser. No. 578,072
Term of patent 14 years
Int. Cl. D7—*05;* D15—*05*
U.S. Cl. D15—53

243,312
PAINT CAN RIM CLEANING TOOL
Gerald D. Chaney, 1143 Nunnelly Road, Paradise, Calif. 95969
Filed Aug. 29, 1975, Ser. No. 542,439
Term of patent 3½ years
Int. Cl.[2] D7—*05;* D8—*05*
U.S. Cl. D7—181



243,313
GLOVE DRAINER AND DRIER
Francis D. Varnado, 575 Dudley, Lakewood, Colo. 80226
Filed Dec. 17, 1975, Ser. No. 641,532
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—196



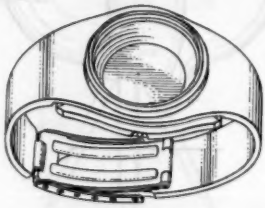
243,314
AXE
Stig Hedvall, Slattervagen 20, 811 00, Sweden
Filed Apr. 17, 1975, Ser. No. 568,906
Claims priority, application Sweden, Nov. 8, 1974, 741842
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—76

243,315
TAMPING DEVICE
James F. Smith, 1116 Geranium Crescent, Virginia Beach, Va. 23456
Filed Jan. 12, 1976, Ser. No. 648,486
Term of patent 7 years
Int. Cl. D8—*02*
U.S. Cl. D8—77

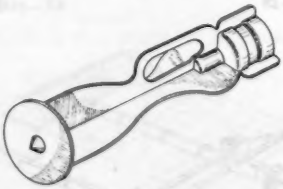
243,316
BOTTLE
Raymond G. Reynolds, Leawood, Kans., assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed July 25, 1975, Ser. No. 566,271
The portion of the term of this patent subsequent to Nov. 30, 1990, has been disclaimed.
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—119

243,317
VEHICLE WHEEL LOCKING NUT
Yasuharu Fukuyama, Los Angeles, Calif., assignor to Fujita Industrial Co., Ltd., Santa Monica, Calif.
Filed Oct. 6, 1975, Ser. No. 619,704
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—273

243,318
COMBINED WRIST-WATCH CASE WITH BAND
Isao Kurihara, Yokohama, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan
Filed July 21, 1975, Ser. No. 597,355
Claims priority, application Japan, Feb. 25, 1975, 50-7250
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—32

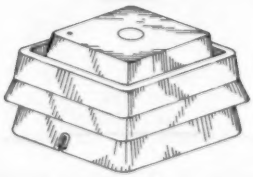


243,319
SURVEY MONUMENT BASE
Peter Berntsen, and Phillip R. Peterson, both of P.O. Box 3025, Madison, Wis. 53704
Filed Sept. 19, 1975, Ser. No. 616,271
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—74

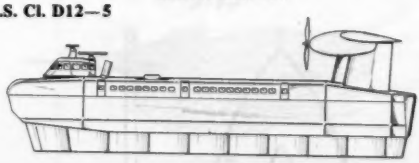


243,320
ARCHERY BOW WEIGHT SCALE
Paul D. MacWilliams, 4039 Brunswick Ave., Los Angeles, Calif. 90039
Filed May 1, 1975, Ser. No. 573,394
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—83

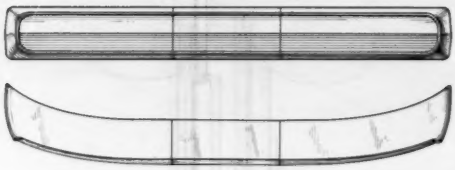
243,321
FIRE DETECTOR
Alvin A. Mayer, Littleton, Colo., assignor to Statitrol Corporation, Lakewood, Colo.
Filed Sept. 2, 1975, Ser. No. 609,341
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—106



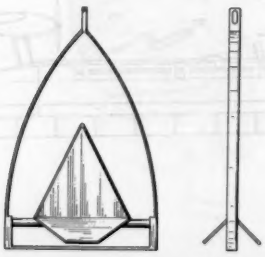
243,322
MARINE AEROGLIDER
Paul Francois Guienne, c/o S.E.D.A.M. 80 Avenue de la Grande Armee, Paris, France
Filed Dec. 2, 1975, Ser. No. 637,076
Claims priority, application France, June 4, 1975, 75.38207
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D12—5



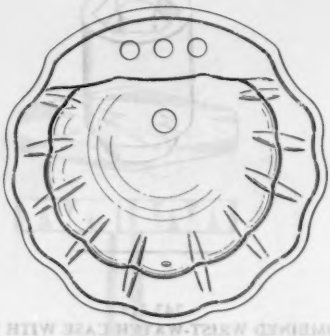
243,323
BUMPER
Raymond A. Waldsmith, Placerville, Calif., assignor to Energy Absorption Systems, Inc., Chicago, Ill.
Continuation-in-part of Ser. No. 594,565, July 9, 1975, abandoned. This application May 6, 1976, Ser. No. 683,839
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—169

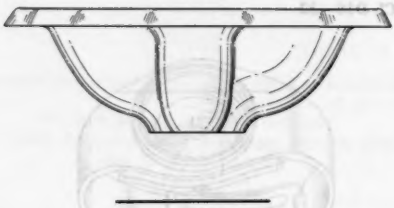


243,324
ANCHOR
James M. Taylor, West Palm Beach, Fla., assignor to Wishbone Marine Products Inc., Pompano Beach, Fla.
Filed Mar. 8, 1976, Ser. No. 664,969
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—215

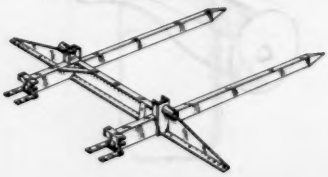


243,325
LAVATORY WASH BOWL
Richard T. Krause, and Richard Van Tilburg, both of Elkhart, Ind., assignors to Leigh Products, Inc., Grand Rapids, Mich.
Filed Nov. 5, 1975, Ser. No. 629,046
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—58





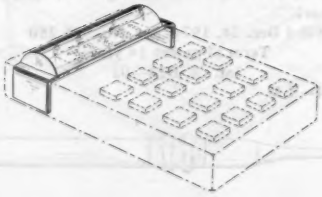
243,326
ROUND BALE HANDLING ATTACHMENT FOR A TRACTOR EQUIPPED WITH A FRONT END BUCKET LOADER OR A REAR END LIFT MECHANISM
Lloyd L. Vandewater, Rte. 1, Box 98, Dexter, Iowa 50070
Filed Apr. 14, 1976, Ser. No. 677,024
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—28



243,327
ELECTRONIC FLASH UNIT
Aloysius Jacobus Maria Beeren, Nuenen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Nov. 29, 1974, Ser. No. 528,286
Claims priority, application Switzerland, June 7, 1974, 58844/74
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D16—42

243,328
TRIPOD
Michio Kawazoe, 30-11 5-chome Narita, Higashi Suginami, Tokyo, Japan
Filed May 23, 1974, Ser. No. 472,515
Claims priority, application Japan, Apr. 11, 1974, 49-012094
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D16—45

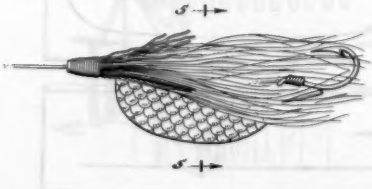
243,329
MAGNIFIER FOR CALCULATOR READ OUT
George A. Snarski, 3342 N. Ernst, Franklin Park, Ill. 60131
Filed June 4, 1975, Ser. No. 583,176
Term of patent 3½ years
Int. Cl. D16—*06*
U.S. Cl. D16—54



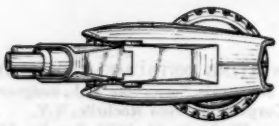
243,330
EYEGLASS FRAME
Karl Pichler, Linz, Austria, assignor to Optyl Corporation, Norwood, N.J.
Filed Nov. 24, 1975, Ser. No. 634,912
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—65

243,331
TOY WRITING INSTRUMENT, OR SIMILAR ARTICLE
Janis V. Jaunarajs, Somerville, N.J., assignor to Shelbud Products Corporation, New Rochelle, N.N.Y.
Filed Apr. 16, 1975, Ser. No. 568,692
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—42

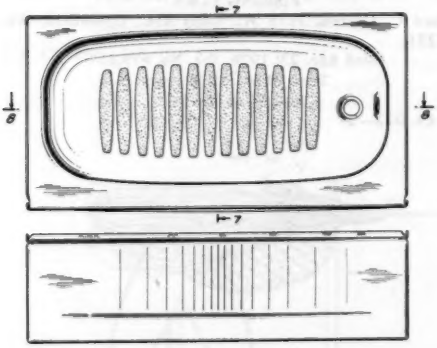
243,332
FISHING LURE
Richard C. Carroll, 3115 W. Vogel Ave., Greenfield, Wis. 53221
Filed Apr. 23, 1976, Ser. No. 679,651
Term of patent 14 years
Int. Cl. D22—*04*
U.S. Cl. D22—27



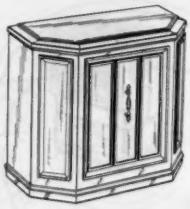
243,333
SPRAYER
Tetsuya Tada, 2,6, 3-chome, Nishinakanobu Shinagawa, Tokyo, Japan
Filed Aug. 27, 1975, Ser. No. 608,268
Claims priority, application Japan, May 8, 1975, 49-17921
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—17



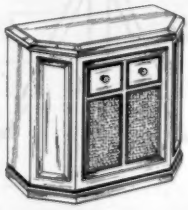
243,334
BATHTUB
Henry M. Stairs, Jr., Somerville, N.J., assignor to American Standard, Inc.
Filed May 25, 1976, Ser. No. 689,900
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—55



243,335
CONSOLE HUMIDIFIER
Bertrand N. Trombley, Birmingham, Mich., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Aug. 15, 1975, Ser. No. 605,133
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—146

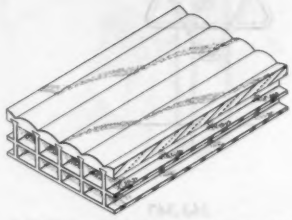


243,336
CONSOLE HUMIDIFIER
David L. Painter, Glenview, Ill., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Aug. 15, 1975, Ser. No. 605,132
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—146

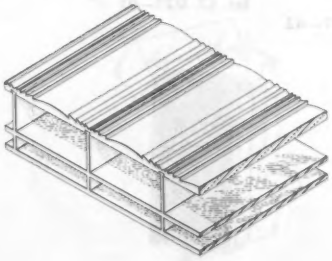


243,337
DENTIST'S SYRINGE
Sven Karl Lennart Goof, Marielundsvej 46 C, DK-2730 Herlev, Denmark
Filed Dec. 24, 1974, Ser. No. 536,250
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—1 D

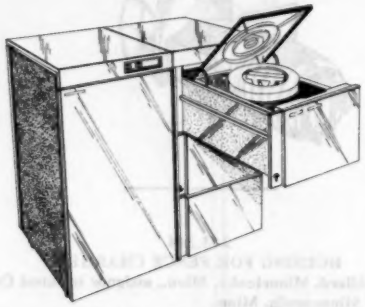
243,338
MULTIPLE CONVERGENCE LINEAR OPTICAL AND RECEIVER PLATE FOR SOLAR CONVERSION OR THE LIKE
Will Clarke England, 7310 Eastcrest Drive, Austin, Tex. 78752
Filed Jan. 21, 1976, Ser. No. 651,097
Term of patent 14 years
Int. Cl. D13—*02;* D26—*05*
U.S. Cl. D26—1 R



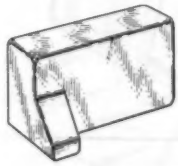
243,339
CONDENSED MULTIPLE CONVERGENCE LINEAR OPTICAL AND CONVECTIVE RECEIVER PLATE FOR SOLAR CONVERSION OR THE LIKE
Will Clarke England, 7310 Eastcrest Drive, Austin, Tex. 78752
Filed Jan. 21, 1976, Ser. No. 651,099
Term of patent 14 years
Int. Cl. D13—*02;* D26—*05*
U.S. Cl. D26—1 R



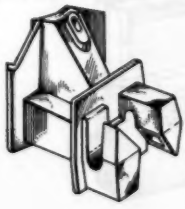
243,340
DISK PACK DRIVE AND CONTROLLER
Richard G. Clayton, Detroit; John M. Blue, Troy, both of Mich.; Jack K. Beduhn, Westlake Village, and Norman P. Guetschoff, Jr., Newbury Park, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.
Filed Dec. 19, 1975, Ser. No. 642,494
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



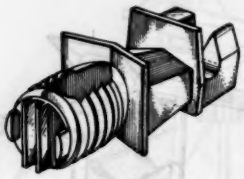
243,341
HAND HELD ELECTRONIC SCANNING CAMERA PROBE
Armin Miller, 2979 Alexis Drive, Palo Alto, Calif. 94304
Filed June 30, 1975, Ser. No. 591,355
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



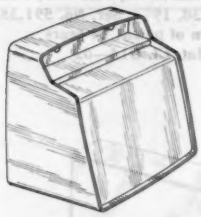
243,342
NAIL-ON ELECTRIC FENCE INSULATOR
Howard Langlie, and Albert T. Berg, Jr., both of Ellendale, Minn. 56026
Filed Dec. 12, 1975, Ser. No. 640,061
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—10



243,343
ROUND-POST ELECTRIC FENCE INSULATOR
Albert T. Berg, Jr., and Howard Langlie, both of Ellendale, Minn. 56026
Filed Dec. 12, 1975, Ser. No. 640,161
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—10



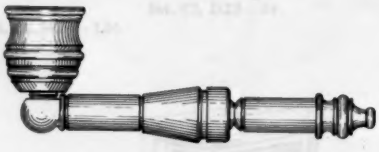
243,344
HOUSING FOR FENCE CHARGER
Peter B. Allard, Minnetonka, Minn., assignor to Introl Corporation, Minneapolis, Minn.
Filed June 10, 1975, Ser. No. 585,461
Term of patent 7 years
Int. Cl. D13—*03*
U.S. Cl. D26—5 R



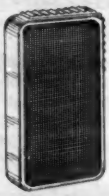
243,345
POCKET DICTATING MACHINE
Henricus Franciscus Theresia Schellens, Eindhoven, and John Collyer Speakman, Netersel, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Sept. 8, 1975, Ser. No. 611,443
Claims priority, application Belgium, Mar. 10, 1975, 50141
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14 B

243,346
STAR-SHAPED PENDANT ROACH CLIP
Jerry L. Samuels, c/o J. Laurence Samuels, Incorporated, 808 Bethlehem Pike, Philadelphia, Pa. 19118
Filed Aug. 5, 1975, Ser. No. 601,986
Term of patent 14 years
Int. Cl. D27—*02*
U.S. Cl. D27—2

243,347
SMOKING PIPE, OR SIMILAR ARTICLE
David Segal, 906 Gordon Terrace, Winnetka, Ill. 60093
Filed Sept. 24, 1975, Ser. No. 616,501
Term of patent 7 years
Int. Cl. D27—*02*
U.S. Cl. D27—3

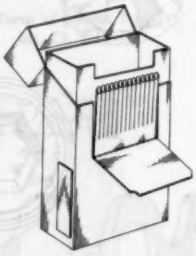


243,348
LIGHTER
Franz Alban Stuetzer, Muhlheim, Main, Germany, assignor to Rowenta-Werke GmbH, Offenbach, Main, Germany
Filed Nov. 24, 1975, Ser. No. 634,958
Claims priority, application Germany, May 30, 1975, 59869
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—42



243,349
LIGHTER
Robert Hocq, Boulogne, France, assignor to Societe Franco-Hispano-Americaine (FRANCISPAM), Saint-Gratien, France
Filed Dec. 9, 1975, Ser. No. 639,102
Claims priority, application France, June 13, 1975, 75.450
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—42

243,350
COMBINED CIGARETTE PACK HOLDER AND MATCHBOOK
Kunihiko Shibata, No. 21-18, 4-chome, Kaminoge, Setagaya, Tokyo, Japan
Filed Feb. 13, 1975, Ser. No. 549,824
Claims priority, application Japan, Aug. 17, 1974, 49-98481[U]
Term of patent 14 years
Int. Cl. D27—*06*
U.S. Cl. D27—49



243,351
ROTARY TIE OUT STAKE FOR A PET ANIMAL
Gaylord V. Laukhuf, Box 89, Antwerp, Ohio 45813
Filed Oct. 17, 1975, Ser. No. 623,420
Term of patent 14 years
Int. Cl. D30—*09*
U.S. Cl. D30—44

243,352
AQUARIUM
James A. Gray, Sr., 209 Anna St., Dayton, Ohio 45417
Filed July 1, 1976, Ser. No. 701,851
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—9

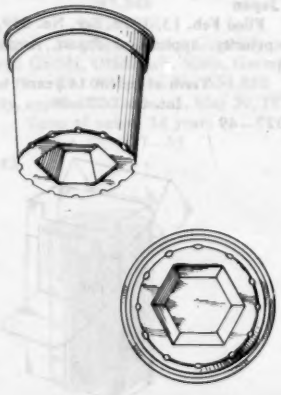
243,353
GOLF HEAD COVER HOLDER
Harry M. Edwards, Los Angeles, Calif., assignor to Matzie Golf Company, Inc.
Filed June 27, 1975, Ser. No. 591,022
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GB

243,354
TENNIS RACKET THROATPIECE
Paul A. Witte, and Thomas Johnson, both of Hopewell, N.J., assignors to Maark Corporation, Plainsboro, N.J.
Filed Sept. 26, 1975, Ser. No. 617,018
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 ST

243,355
GOLF CLUB GRIP
Clifford A. Spencer, Akron, Ohio, assignor to Eaton Corporation
Filed June 3, 1975, Ser. No. 583,301
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GS

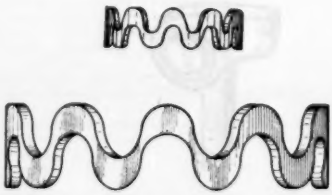
243,356
TOY ANIMAL FIGURE AND RIDER
John D. Birdsall, 1262 Sunset Plaza Drive, Los Angeles, Calif. 90069
Filed May 30, 1975, Ser. No. 582,220
Term of patent 7 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 B

243,357
PLANT CONTAINER
Ronald John Gross, 10 Surrey Road, Mount Waverley, Victoria, Australia
Filed Nov. 11, 1974, Ser. No. 522,918
The portion of the term of this patent subsequent to Jan. 11, 1991, has been disclaimed.
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—152

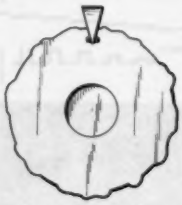


243,358
PLANT CONTAINER
Ronald John Gross, 10 Surrey Road, Mount Waverley, Victoria, Australia
Filed Nov. 11, 1974, Ser. No. 522,919
The portion of the term of this patent subsequent to Jan. 11, 1991, has been disclaimed.
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—152

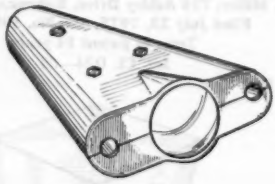
243,359
RING OR BRACELET
Loris Nevrous, 29, Rue Edouard Nortier, Neuilly-sur-Seine, Hauts-de-Seine, France
Filed Sept. 23, 1974, Ser. No. 508,286
Claims priority, application France, Mar. 25, 1974, 72.741112
Term of patent 7 years
Int. Cl. D11—*01*
U.S. Cl. D11—4



243,360
PENDANT
Gary K. Kobashikawa, 3460 Maluhia St., Honolulu, Hawaii 96816
Filed July 23, 1975, Ser. No. 598,213
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—83

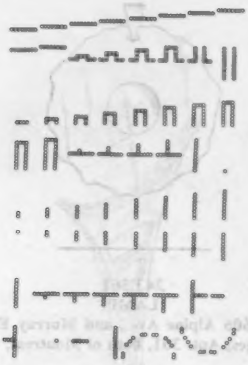


243,361
LAMP
Saul Corber, 5606 Alpine Ave., and Murray E. Moss, 4874 Cote des Neiges, Apt. 301, both of Montreal, Quebec, Canada
Filed Oct. 21, 1974, Ser. No. 516,598
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—24 A

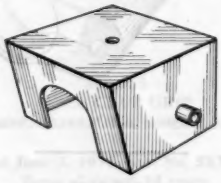


243,362
FOOD TRAY TEMPERATURE MAINTENANCE STATION
George K. Shumrak, Natick, and Anthony Mack, North Reading, both of Mass., assignors to Sweetheart Plastics, Inc., Wilmington, Mass.
Filed Oct. 6, 1975, Ser. No. 619,624
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D15—104

243,363
FONT OF CHARACTERS FOR FORMING A GRAPHIC DISPLAY
John E. Crowe, Havertown, Pa., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Oct. 9, 1974, Ser. No. 513,247
Term of patent 14 years
Int. Cl. D18—*03*
U.S. Cl. D64—12 B

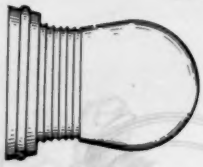


243,364
HEAD HOOD FOR RESPIRATORY INHALATION SYSTEMS
Bruce B. Miller, 714 Ashley Drive, Kalamazoo, Mich. 49001
Filed July 23, 1975, Ser. No. 598,858
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—1 F



243,365
MEDICAL AIRWAY TUBE SEPARATOR OR THE LIKE
David E. Cross, Folkestone, England, assignor to Smiths Industries Limited, London, England
Filed Mar. 31, 1976, Ser. No. 672,173
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D83—1 R

243,366
PROTECTIVE CASING FOR PACIFIERS
Linda L. Lybe, 14075 Lincoln Ave., and Lola M. Coulombe, 14711 La Salle, both of, Dolton, Ill. 60419
Filed Aug. 18, 1975, Ser. No. 605,597
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D83—8 B



243,367
HAIR DRYER
Petrus Jacobus Johanna Nagelkerke, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Aug. 11, 1975, Ser. No. 605,219
Claims priority, application United Kingdom, Feb. 11, 1975, 969820/75
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 F

243,368
HAIR DRYER
Petrus Jacobus Johanna Nagelkerke, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Aug. 11, 1975, Ser. No. 605,220
Claims priority, application United Kingdom, Feb. 11, 1975, 969820/75
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 F

243,369

DEEP TEXTURED DECORATIVE LAMINATE

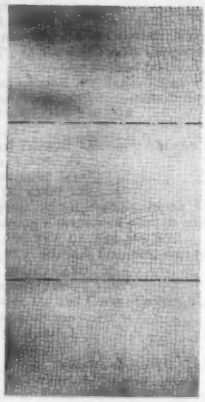
Jack August Willard, Hamilton, Ohio, assignor to Formica Corporation, Cincinnati, Ohio

Filed Mar. 27, 1975, Ser. No. 562,522

Term of patent 14 years

Int. Cl. D5—*06*

U.S. Cl. D87—3 G



243,370

TEXTILE FABRIC

Susan Collier, London, England, assignor to Liberty of London Prints Limited, London, England

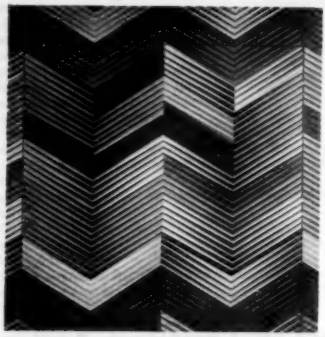
Filed Feb. 24, 1975, Ser. No. 552,717

Claims priority, application United Kingdom, Aug. 23, 1974, 512968/74

Term of patent 14 years

Int. Cl. D5—*05*

U.S. Cl. D92—1 Y



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 8TH DAY OF FEBRUARY, 1977

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. B. Dick Company: *See—*
Ort, George M., 4,007,046.

A/S Ferrosan: *See—*
Christensen, Jorgen Anders; and Squires, Richard Felt, 4,007,196.

Abbink, Henry C.; and Hostetler, James W., to Litton Systems, Inc. Cathode construction for long life lasers. 4,007,431, Cl. 331-94.5PE.

Abbott Laboratories: *See—*
Steer, Peter Leslie, 4,006,744.
Von Esch, Anne Mary; and Crovetti, Aldo Joseph, 4,007,185.

Abler, Norman C., to Bunker Ramo Corporation. Manufacturing of patterned deep pile circular knitted fabric. 4,006,609, Cl. 66-9.00B.

Abraham, Nedumparambil A.; Bagli, Jehan F.; and Bogri, Tibor, to American Home Products Corporation. Intermediates for prostanoic acids. 4,007,171, Cl. 260-240.00R.

Abrams, Nathan: *See—*
Horowitz, Carl; Dichter, Michael; Abrams, Nathan; and Mangaraj, Duryodhan, 4,006,749.

Accrabond Corporation: *See—*
House, Jack L., 4,007,322.

Acda, Petrus Marinus; and Karreman, Jacob, to Polva Nederland B.V. Pipe bell end having a thickened portion and apparatus for forming the bell end. 4,006,757, Cl. 138-109.000.

Ackerman, Stephen P. Blanket fastening means for a cylinder blanket. 4,006,686, Cl. 101-415.100.

Acme Scale Company: *See—*
Stultz, Frederick L.; and Clark, George C., 4,006,789.

Acorn Engineering Company: *See—*
Morris, Earl L., 4,006,572.

Adachi, Kiyoshi: *See—*
Matsumoto, Zenji; Adachi, Kiyoshi; Fujimoto, Toyohisa; and Ninomiya, Nobutaka, 4,007,014.

Adamis, Robert J., to Atlas Metal Spinning Company. Crepe-making pan and support. 4,006,676, Cl. 99-422.000.

Adams Rite Products, Inc.: *See—*
Geer, Larry A.; and Sheffer, Ralph L., 4,006,951.

Adams, Theodore J.: *See—*
Porter, Stephen G.; and Adams, Theodore J., 4,006,553.

Addie, Lee W.; and Nikolaus, Harold W., to Armstrong Cork Company. Process for making embossed needle-bonded fabric wall coverings. 4,007,071, Cl. 156-148.000.

Addison, George Thomas: *See—*
Gapper, Terence John; Addison, George Thomas; and Tate, David Arthur, 4,006,935.

Adelmann, Siegfried; Margotte, Dieter; Vernaleken, Hugo; Niederprum, Hans; Meussdoerffer, Johann Nikolaus; and Nouvertne, Werner, to Bayer Aktiengesellschaft. Use of perfluoroalkanesulphonic acid amides and/or cyclimmonium salts of perfluoroalkansulphonic acids as mold release agents. 4,007,150, Cl. 260-30.80R.

Adlerborn, Jan: *See—*
Isaksson, Sven-Erik; Adlerborn, Jan; and Larker, Hans, 4,007,251.

Adomanite, Yanina Antono: *See—*
Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Lepnidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 4,007,317.

Adrian, Fritz, to Deutsche Babcock & Wilcox Aktiengesellschaft. Method for transportation and utilization of waste heat of large condenser power plants. 4,006,857, Cl. 237-2.00B.

Advanced Sports Corporation: *See—*
Wood, Robert L., 4,006,503.

Aeppli, Kurt, to Zellweger, Ltd. Method of and apparatus for detecting faults in the operation of open-end spinning machines. 4,007,457, Cl. 340-259.000.

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Saverio, Del Bianco, 4,006,632.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See—*
Gillet, Bernard, 4,007,350.
Patin, Pierre, 4,006,916.

Agency of Industrial Science & Technology: *See—*
Kono, Hidehiko; Oka, Masayo; and Kawamura, Sadakazu, 4,007,440.

AGFA-Gevaert, A.G.: *See—*
Bien, Franz; Pustka, Karel; and Wagensonner, Eduard, 4,006,978.
Helmberger, Josef; and Ruf, Wolfgang, 4,007,489.
Wagensonner, Eduard; and Winkler, Alfred, 4,006,975.
Wagensonner, Eduard; Borowski, Kurt; and Knauer, Dieter, 4,007,467.

Agribest, Inc.: *See—*
Redmon, Jackson T.; Haidle, Irvin; Herzog, Donald; and Greene, Joel C., 4,006,715.

Aiba, Masahiko: *See—*
Fujimoto, Isao; Kasubuchi, Takeshi; and Aiba, Masahiko, 4,007,463.

Air Control Industries, Inc.: *See—*
Sallee, John P.; Speight, Bill W.; and McLain, Bruce H., 4,007,024.

Airco, Inc.: *See—*
Wallouch, Rudolph W., 4,007,324.

Aisin Seiki Kabushiki Kaisha: *See—*
Murakami, Noboru, 4,006,652.

Aktiebolaget Svenska Flaktfabriken: *See—*
Nilsson, Karl N. A., 4,006,856.

Aladdin Industries, Incorporated: *See—*
Cummings, John S., 4,006,835.

Albany International Corporation: *See—*
Romanski, Eric R.; and Stevens, Orrin C., 4,006,760.

Albert, Richard D. Multi-target X-ray source. 4,007,375, Cl. 250-404.000.

Albright, Penrose Lucas. Wheel having resilient spoke means. 4,006,765, Cl. 152-12.000.

Alder, G. Michael: *See—*
Neddo, Keith S.; Alder, G. Michael; and Gwilliam, James L., Jr., 4,006,558.

Alger, Shirl R.; Arnold, Ronald S.; and Schuler, Manfred, to All-Power Manufacturing Co. Machine tool coolant apparatus. 4,006,861, Cl. 239-311.000.

All-Power Manufacturing Co.: *See—*
Alger, Shirl R.; Arnold, Ronald S.; and Schuler, Manfred, 4,006,861.

Allegheny Ludlum Industries, Inc.: *See—*
Deverell, Harry E., 4,007,038.

Allen-Bradley Company: *See—*
Kuntzsch, Donald W., 4,006,653.

Allen, Frank L., Jr.: *See—*
Webster, Walter C., III; and Allen, Frank L., Jr., 4,006,866.

Allgaier, Werner, to Raychem Corporation. Strain relief device. 4,006,956, Cl. 339-103.00M.

Allmanna Svenska Elektriska Aktiebolaget: *See—*
Isaksson, Sven-Erik; Adlerborn, Jan; and Larker, Hans, 4,007,251.

Allport, Maurice James, to Lucas Electrical Company Limited, The. Three phase full wave rectifier assembly. 4,007,402, Cl. 317-100.000.

Alten, Ralph W., to Dynamic Industries, Inc. Method and apparatus for sensing and measuring fluid pressure. 4,006,641, Cl. 73-398.0AR.

Alten, Ralph W., to Dynamic Industries, Inc. Method and apparatus for sensing fluid pressure. 4,007,343, Cl. 200-83.00J.

Alticosalian, Girair Hagop Perfume dispenser. 4,006,841, Cl. 222-42.000.

Alvey Inc.: *See—*
Werntz, Charles W., 4,006,815.
Werntz, Charles W., 4,006,816.

Amari, Shinji, to Sony Corporation. Magnetic recording and/or reproducing apparatus. 4,007,482, Cl. 358-4.000.

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American Beverage Control: *See—*
Shannon, Joseph W., 4,006,840.

American Chain & Cable Company, Inc.: *See—*
Barker, Loren B., 4,006,929.

American Cyanamid Company: *See—*
Bernady, Karel Francis; Floyd, Middleton Brawner, Jr.; Poletto, John Frank; Schaub, Robert Eugene; and Weiss, Martin Joseph, 4,007,210.
Bernstein, Seymour; Bauman, Norman; and Heller, Milton David, 4,007,270.
Martin, John Henry Edward James; Tresner, Homer David; and Porter, John Norman, 4,007,167.
Meyers, Marion Douglas; and Landi, Henry Patrick, 4,006,966.
Newman, Howard, 4,007,198.
Panzer, Hans Peter; O'Connor, Michael Niall Desmond; and Baccei, Louis J., 4,007,200.
Safir, Sidney Robert, 4,007,272.

American Home Products Corporation: *See—*
Abraham, Nedumparambil A.; Bagli, Jehan F.; and Bogri, Tibor, 4,007,171.

AMF Incorporated: *See—*
Ostreicher, Eugene A., 4,007,113.
Ostreicher, Eugene A., 4,007,114.

AMP Incorporated: *See—*
Hopkins, John Root; Renn, Robert Maurice; and Southard, Robert Keith, 4,006,959.
Long, Robert Alvin; and Over, William Boderick, 4,006,519.

Ampco Foods Inc.: *See—*
Shatila, Mounir A.; and Huffman, Samuel J., 4,007,292.

Ananiev, Leonid Semenovich: *See—*
Doilov, Svyatoslav Kirillovich; Efimov, Viktor Mikhailovich; Ioonas, Rikhard Eduardovich; Nazinin, Nikolai Andreevich; Piik, Enn Edgarovich; Raad, Khans Eduardovich; Roox, Ivar Kharaldovich; Serebryannikov, Nikolai Dmitrievich; Shaganov, Jury Vasilievich; Ananiev, Leonid Semenovich; and Volkov, Alexei Sergeevich, 4,007,093.

Anceau, Francois; Beauducel, Claude; Courboulay, Pierre; and Cretin, Jacques, to Institut Francais du Petrole, des Carburants et Lubrifiants et Entreprise de Recherches et d'Activites Petrolieres Elf. Microprogrammed computing device. 4,007,444, Cl. 340-172.500.

Anderson, Frank R.; and Nadon, James W., to Cincinnati Milacron-Heald Corporation. Work table index mechanism. 4,006,651, Cl. 74-826.000.

Anderson, James Hilbert. Tube expander utilizing hydraulically actuated pistons. 4,006,619, Cl. 72-54.000.

Anderson, Reynold M.; and Tullar, Donald E., to Caterpillar Tractor Co. Tilt linkage for loader buckets. 4,006,834, Cl. 214-776.000.

Anderson, Richard W.; and Bodenrader, Frederick F., to GTE Sylvania Incorporated. Back-lighted display arrangement. 4,006,546, Cl. 40-132.00D.

Anderson, Teddy Lee: *See—*
Findley, Gerald Ivan; and Anderson, Teddy Lee, 4,007,442.

Ando, Shigenori; Ota, Masato; and Kawashima, Tadashi, to Kabushiki Kaisha Daini Seikosha. Spindle device having bearings lubricated with oil jet. 4,006,944, Cl. 308-187.000.

Ando, Shigenori: *See—*
Moritomo, Sadao; Kikuchi, Shinichi; and Ando, Shigenori, 4,006,953.

Andringa, Keimpe, to Raytheon Company. Laser gyroscope. 4,006,989, Cl. 356-106.0LR.

Annerhed, Karl Bertil Verner; and Hemlin, Rolf Ingemar, to Sandco Ltd. System for installing high strength steel belts. 4,007,351, Cl. 219-50.000.

Annino, Raymond; Prescott, Robert C.; Karas, Edwin L.; and Kalinoski, Richard W., to Foxboro Company, The. Pneumatic chromatograph. 4,006,624, Cl. 73-23.100.

Ansell, Joseph L.; Brusius, Phillip G.; and Baker, Raymond J., to United States of America, Army. Method for making thick film capacitors. 4,007,296, Cl. 427-79.000.

Anstey, Nigel A., to Seiscom Delta Inc. Means for seismic prospecting from bulk liquid carriers. 4,006,795, Cl. 181-121.000.

Antonevich, John N., to Blackstone Corporation. Methods and apparatus for skimming liquids. 4,007,119, Cl. 210-65.000.

Aoki, Seiji; Kamiyana, Akira; and Matsuda, Kokichi. Method for continuously supplying plastics film strip from extruder head. 4,007,078, Cl. 156-159.000.

Aono, Tetsuya: *See—*
Noguchi, Shunsaku; Aono, Tetsuya; Araki, Yoshiaki; and Kawai, Kiyohisa, 4,007,225.

Aonuma, Masashi; and Tamai, Yasuo, to Fuji Photo Film Co., Ltd. Ferromagnetic metal powder comprising lead and method for making the same. 4,007,072, Cl. 148-105.000.

Aoyama, Syunichi: *See—*
Takagi, Yasuo; Hioki, Kazuo; and Aoyama, Syunichi, 4,006,721.

Applications Mecaniques et Robinetterie Industrielle A.M.R.I.: *See—*
Bonafous, Maurice, 4,006,882.

Applications Mecaniques et Robinetterie Industrielles A.M.R.I.: *See—*
Bonafous, Maurice, 4,006,761.

Araki, Yoshiaki: *See—*
Noguchi, Shunsaku; Aono, Tetsuya; Araki, Yoshiaki; and Kawai, Kiyohisa, 4,007,225.

Archifar Industrie Chimiche del Trentino S.p.A.: *See—*
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ARCO Polymers, Inc.: *See—*
Weisser, Eugene P.; Osan, G. Alan; and Mailki, Edward P., 4,007,319.

Arluck, Elmer M., to Yardney Company. Orthopedic device. 4,006,741, Cl. 128-90.000.

Armstrong Cork Company: *See—*
Addie, Lee W.; and Nikolaus, Harold W., 4,007,071.
Bulson, Walter T.; Hartranft, George R.; and Ray, Leonard N., Jr., 4,007,003.

Arnold Engineering Company: *See—*
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Arnold, Ronald S.: *See—*
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Asada, Sadame: *See—*
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Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Ogawa, Shinsaku; Yamanoue, Matsuei; and Oyabu, Norio, 4,007,151.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Miyakawa, Seinan, 4,007,466.

Association of Motion Picture and Television Producers Inc., The: *See—*
Vlahos, Petro, 4,007,487.

Astinet, Helmut: *See—*
Thoma, Gustav; Tscharf, Fritz; and Astinet, Helmut, 4,006,561.

Atco Manufacturing Co., Inc.: *See—*
Cross, David L., 4,006,716.

Atlantic Richfield Company: *See—*
Cathriner, Richard L., 4,006,630.

Atlas Metal Spinning Company: *See—*
Adamis, Robert J., 4,006,676.

Atomic Energy of Canada Limited: *See—*
Lemieux, Raymond Urgel; Sanford, Emerson Cecil; and Prescott, John Fraser, 4,007,257.

Austin, Milton; and Kendall, Arthur G. Novel fishing rod support. 4,006,825, Cl. 211-60.00R.

Auxer, Marvin L.; McCann, Floyd E.; and Shepherd, Gerald D., to Unit Rig & Equipment Co. Bucket door snubber. 4,006,832, Cl. 214-146.00R.

Avery, Michael J.; Martino, Lawrence A.; and Yonko, Jon D., to Monsanto Company. Automated blow molding machine startup. 4,007,244, Cl. 264-99.000.

Avery Products Corporation: *See—*
Dunning, Richard E., 4,007,067.

Avrea, Walter C. Automatic positive anti-aeration system for engine cooling system. 4,006,775, Cl. 165-51.000.

Ayling, Mildred Avis: *See—*
Summers, John Gilbert; Josh, Michael John; and Ayling, Mildred Avis, 4,007,104.

B. F. Goodrich Company, The: *See—*
Leeson, Edward J.; and Ludwig, Robert U., 4,007,147.

B S P International Foundations Limited: *See—*
Elliott, Roger Michael, 4,006,886.

Baatrup, Johannes Vagn; and Christensen, Thorkild, to Danfoss A/S. Hydraulic control means, especially a steering means. 4,006,663, Cl. 91-29.000.

Baccei, Louis J.: *See—*
Panzer, Hans Peter; O'Connor, Michael Niall Desmond; and Baccei, Louis J., 4,007,200.

Back, Carl Franklin, to Ingersoll-Rand Company. Power transfer mechanism. 4,006,807, Cl. 192-48.900.

Baczek and James Company, Inc.: *See—*
Baczek, Tadeusz A.; and James, Leslie M. L., 4,006,725.

Baczek, Tadeusz A.; and James, Leslie M. L., to Baczek and James Company, Inc. Spark plug construction for lean mixture burning internal combustion engines. 4,006,725, Cl. 123-32.0SJ.

Badger, Everett H., to Textron, Inc. Fuel tank level detector and shut-off valve. 4,006,762, Cl. 141-198.000.

Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See—*
Hickmann, Eckhard; Fischer, Martin; Volkert, Otto; and Jun, Mong-Jon, 4,007,209.
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Bagli, Jehan F.: *See—*
Abraham, Nedumparambil A.; Bagli, Jehan F.; and Bogri, Tibor, 4,007,171.

Baier, Gunter: *See—*
Batza, Willi; Baier, Gunter; and Schmidt, Hermann, 4,007,023.

Bailey, Carl W., III; and Dilling, Peter, to Westvaco Corporation. Dyestuff filler derived from kraft black liquor. 4,007,004, Cl. 8-83.000.

Bailey, Edward L., to Owens-Illinois, Inc. Variable strength plastic wrap on glass bottles. 4,007,246, Cl. 264-129.000.

Baird, William C., Jr.; and Bearden, Roby, Jr., to Exxon Research and Engineering Company. Combined desulfurization and hydroconversion with alkali metal oxides. 4,007,109, Cl. 208-108.000.

Baird, William Chalmers, Jr., to Exxon Research and Engineering Company. Residua desulfurization and hydroconversion with sodamide and hydrogen. 4,007,111, Cl. 208-108.000.

Baker, Bruce A., Jr.: *See—*
Springer, Willard J.; and Baker, Bruce A., Jr., 4,007,102.

Baker, Don R.; and Gutman, Arnold D., to Stauffer Chemical Company. Certain oxime compositions and their use in controlling fungi. 4,007,227, Cl. 260-566.0AE.

Baker, Peter D., to Smiths Industries Limited. Igniters. 4,007,391, Cl. 313-131.00A.

Baker, Raymond J.: *See—*
Ansell, Joseph L.; Brusius, Phillip G.; and Baker, Raymond J., 4,007,296.

Baker, Theodore Harris; Ghafghaichi, Majid; Stevens, Richard Charles; and Wimpfheimer, Hans, to International Business Machines Corporation. Planarizing insulative layers by resputtering. 4,007,103, Cl. 204-192.000.

Ballard, Denis George Harold; Murray, Robert Thomas; and Jeffs, George Michael Fingland, to Imperial Chemical Industries Limited. Production of fibrils. 4,007,247, Cl. 264-140.000.

Ballarin, Jurgen; and Mattig, Peter, to Bosch-Siemens Hausgerate GmbH. Refrigerating device. 4,006,601, Cl. 62-80.000.

Balm Paints Limited: *See—*
Clarke, Barry John; Kershaw, Robert William; and Lubbeck, Frederick John, 4,007,142.

Bangor Punta Operations, Inc.: *See—*
Kippen, Albert J., 4,006,851.

Bara, Edwin Stanley, to Motorola, Inc. Crescent reset system for fast forward 8-track cartridge player. 4,006,853, Cl. 226-178.000.

Barber-Colman Company: *See—*
Darsie, Burns, 4,006,759.

Barber, Everett M., to Texaco Inc. Apparatus useful for the production of hydrogen. 4,007,015, Cl. 23-281.000.

Barish, Benjamin J. Electrical tick-tack-toe game. 4,006,903, Cl. 273-130.0AB.

Barker, Loren B., to American Chain & Cable Company, Inc. Vacuum pad. 4,006,929, Cl. 294-64.00R.

Barrett, DeLoris Joan: *See—*
Peters, Jack; and Barrett, DeLoris Joan, 4,006,800.

Barrett, Gary L.; and Shoberg, Ralph S., to GSE, Inc. Torque measuring apparatus. 4,006,629, Cl. 73-139.000.

Barth, Harry: *See—*
Schuddemage, Horst-Dieter; Jastrow, Horst; and Barth, Harry, 4,007,234.

Bartholomew, Donald D., to Merit Plastics, Inc. Non-threaded tubing connector. 4,006,922, Cl. 285-39.000.

BASF Aktiengesellschaft: *See—*
Blechschmitt, Kurt; Wirth, Friedrich; Hornberger, Paul; Reuter, Peter; and Buerger, Gert, 4,007,136.
Hartmann, Heinrich; and Druschke, Wolfgang, 4,007,215.
Scholz, Norbert; Vock, Georg Friedrich; Erdmann, Kurt; John, Guenther; Frielingsdorf, Hans; Gruber, Wolfgang; and Mueller-Tamm, Heinz, 4,007,321.
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BASF Wyandotte Corporation: *See—*
Kakar, Sarwan K.; Kappler, Frank R.; Gomes, Gilbert S.; and Cramer, John J., 4,007,305.

Bassignani, Anthony L. Material measuring and dispensing device. 4,006,842, Cl. 222-43.000.

Bassous, Ernest; Kuhn, Lawrence; Reisman, Arnold; and Taub, Howard H., to International Business Machines Corporation. Ink jet nozzle. 4,007,464, Cl. 346-75.000.

Bastide, Robert Guy Emile, to Etat Francais. Pyrotechnical safety relay. 4,006,689, Cl. 102-70.00R.

Battelle Memorial Institute: *See—*
Davis, Thomas J., 4,006,625.
Kenan, Richard P.; Verber, Carl M.; and Wood, Van E., 4,006,967.

Batza, Willi; Baier, Gunter; and Schmidt, Hermann, to Metallgesellschaft Aktiengesellschaft. Electrostatic precipitator with collector-electrode spacers. 4,007,023, Cl. 55-112.000.

Batzer, Hans: *See—*
Habermeier, Jurgen; Batzer, Hans; and Porret, Daniel, 4,007,199.

Baues, Peter; Mahlein, Hans; Reichelt, Achim; and Winzer, Gerhard, to Siemens Aktiengesellschaft. Controllable, electro-optical grating coupler. 4,006,963, Cl. 350-96.00C.

Bauman, Norman: *See—*
Bernstein, Seymour; Bauman, Norman; and Heller, Milton David, 4,007,270.

Bauman, Robert Andrew, to Colgate-Palmolive Company. Pharmaceutical compositions containing quaternary ammonium compounds. 4,007,281, Cl. 424-300.000.

Baumann, Richard S.; and Raboin, Ronald K., to Western Industries, Inc. Brazing alloy and brazing paste for gas container joints. 4,006,838, Cl. 220-3.000.

Bayer Aktiengesellschaft: *See—*
Adelmann, Siegfried; Margotte, Dieter; Vernaleken, Hugo; Niederprum, Hans; Meussdoerffer, Johann Nikolaus; and Nouvertne, Werner, 4,007,150.
Bien, Hans-Samuel; and Klauke, Erich, 4,007,164.
Blahak, Johannes; Muller, Erwin; and Kleimann, Helmut, 4,007,239.
Maurer, Fritz; Riebel, Hans-Jochem; Rohe, Lothar; Hammann, Ingeborg; and Homeyer, Bernhard, 4,007,269.
Psaar, Hubertus, 4,007,172.
Puppe, Lothar; Ulisch, Gunter; and Schwochow, Friedrich, 4,007,253.

Bayliss, John Patrick, to Girling Limited. Automatic slack adjusters for vehicles. 4,006,801, Cl. 188-196.0BA.

BDH, Inc.(Entire): *See—*
Bowen, James H., 4,007,120.

Bearden, Roby, Jr., to Exxon Research and Engineering Company. Residua desulfurization with sodium oxide and hydrogen. 4,007,110, Cl. 208-108.000.

Bearden, Roby, Jr.: *See—*
Baird, William C., Jr.; and Bearden, Roby, Jr., 4,007,109.

Beauducel, Claude: *See—*
Anceau, Francois; Beauducel, Claude; Courboulay, Pierre; and Cretin, Jacques, 4,007,444.

Becker, Milton J.; and Line, William F. Preparation of reference serum from animal blood. 4,007,008, Cl. 23-230.00B.

Beckley, Charles R. Folding seat. 4,006,910, Cl. 297-16.000.

Beckman Instruments, Inc.: *See—*
Buzza, Edmund E.; and Lillig, John E., 4,007,105.

Behr, Michael Isaac; Blessum, Norman Stephen; and Iwan, Wilfred Dean, to Burroughs Corporation. Track positioning system for magnetic transducer head. 4,007,493, Cl. 360-77.000.

Behringwerke Aktiengesellschaft: *See—*
Helting, Torsten Bertil, 4,007,265.

Beier, Edmar, to Volkswagenwerk Aktiengesellschaft. Apparatus for tensioning a safety belt. 4,006,644, Cl. 74-242.1FP.

Belanger, Nicholas E.; Bentley, Floyd; and Geoffrey, David C., to Stanley Works, The. Door system with improved weatherseal. 4,006,562, Cl. 49-380.000.

Bell & Howell Company: *See—*
Wells, Thomas R., 4,006,980.

Bell Telephone Laboratories, Incorporated: *See—*
Bobeck, Andrew Henry, 4,007,447.
Bonyhard, Peter Istvan; Chen, Yu-Ssu; and Smith, James Lanson, 4,007,453.
Brooks, Richard Donald, 4,007,384.
Fisher, Phil Dewey; and Hock, Richard Howard, 4,007,413.
Hagelbarger, David William, 4,007,459.
Hetherington, Irvine Keers; and Smith, DeWitt Paul, 4,007,335.
Joel, Amos Edward, Jr., 4,007,339.
Lien, Monte Deh, 4,007,421.
McDonald, Henry Stanton, 4,007,334.
Mohsen, Amr Mohamed, 4,007,381.
Tanner, Robert Ivins, 4,006,872.

Bellaplast GmbH: *See—*
Thiel, Alfons W.; and Hell, Hans, 4,006,839.

Belli, Frank G.: *See—*
Buckley, David A.; Ciccarelli, Roger N.; and Belli, Frank G., 4,007,042.

Bender, Eberhard: *See—*
Wolf, Dieter; Bender, Eberhard; and Weber, Theodor, 4,007,095.

Bendix Corporation, The: *See—*
Price, William G., 4,006,669.
Vold, Gunnar J., 4,007,412.

Beneke, Jene A., to Verson Allsteel Press Company. Two-speed clutch and brake system. 4,006,806, Cl. 192-18.00A.

Benker, Guy; Louvel, Bernard; Tauszig, Dominique; and Vourron, Bernard, to Institut Francais du Petrole, des Carburants et Lubrifiants et Entreprise de Recherches et d'Activites Petrolieres Elf. Method of controlling a distillation column for topping crude petroleum. 4,007,112, Cl. 208-350.000.

Benrey, Iveta Markova: *See—*
Kostadinov, Spas Kostadinov; Benrey, Iveta Markova; Shopov, Vassil Angelov; Kostadinova, Marika Yokimova; and Dimitrova, Maria Staneva, 4,007,248.

Bense, William Malcolm, to Leesona Corporation. Strand scattering winding machine. 4,006,863, Cl. 242-18.100.

Bentley, Floyd: *See—*
Belanger, Nicholas E.; Bentley, Floyd; and Geoffrey, David C., 4,006,562.

Berg, Arne L. Artificial reverberation system. 4,007,332, Cl. 179-1.00J.

Berger, Christian; Farge, Daniel; Gros, Georges; Messer, Mayer Naoum; and Moutonnier, Claude, to Rhone-Poulenec S.A. Cephalosporin derivatives. 4,007,176, Cl. 260-243.00C.

Berger, Peter, to Metallschlauch-Fabrik Pforzheim (vorm. Hch. Witzenmann) Gesellschaft mit beschrankter Haftung. Spring support. 4,006,873, Cl. 248-54.0CS.

Berges, David A., to SmithKline Corporation. O-acyl-7-acylaminocephalosporadesic acids. 4,007,178, Cl. 260-243.00C.

Bergische Stahl-Industrie: *See—*
Klein, Willi; Rocholl, Henning; Feldhoff, Hermann-Josef; and Otto, Alfred, 4,006,803.

Bergwerksverband GmbH: *See—*
Gappa, Gunther; Juntgen, Harald; Klein, Jurgen; and Reichenberger, Jurgen, 4,007,116.

Bernady, Karel Francis; Floyd, Middleton Brawner, Jr.; Poletto, John Frank; Schaub, Robert Eugene; and Weiss, Martin Joseph, to American Cyanamid Company. Novel 3-triphenylmethoxy-1-alkynes, 3-triphenylmethoxy-1-trans-alkenyl-dialkyl-alanes, and lithium 3-triphenyl-methoxy-1-trans-alkenyl-dialkyl-alanates. 4,007,210, Cl. 260-395.000.

Berney, Jean-Claude. Apparatus for synchronization of a motor. 4,007,408, Cl. 318-314.000.

Bernsen, Borg, to Xerox Corporation. Electronic copy analysis. 4,007,326, Cl. 358-280.000.

Bernstein, Seymour; Bauman, Norman; and Heller, Milton David, to American Cyanamid Company. Complement inhibitors. 4,007,270, Cl. 424-230.000.

Berrer, Dagmar, to Ciba-Geigy Corporation. Herbicidally active triazin-derivatives. 4,007,032, Cl. 71-93.000.

Bethlehem Corporation, The: *See—*
Weber, Arthur P., 4,007,016.

Bethlehem Steel Corporation: *See—*
Shipman, Johnson; and Gilles, Herbert L., 4,006,633.

Beugin, Louis E. Lawn bag caddy. 4,006,928, Cl. 294-1.00R.

Bianchetta, Donald L.; Lohbauer, Kenneth R.; and Rhodes, Sammy J., to Caterpillar Tractor Co. Hydraulic control system for load supporting hydraulic motors. 4,006,667, Cl. 91-445.000.

Biebuyck, Lawrence F., to Howmet Corporation. Narrow frame wall structure. 4,006,573, Cl. 52-732.000.

Bien, Franz; Pustka, Karel; and Wagensonner, Eduard, to AGFA-Gevaert, A.G. Motion picture camera with motor control circuit having decreased power consumption. 4,006,978, Cl. 352-174.000.

Bien, Hans-Samuel; and Klauke, Erich, to Bayer Aktiengesellschaft. Azo dyestuffs containing 6-fluoro-pyrimidinyl 4-reactive group. 4,007,164, Cl. 260-146.00D.

Billette, Richard J.; and Zias, Arthur R., to National Semiconductor Corporation. Flow meter. 4,006,634, Cl. 73-207.000.

Binder, Heinrich; Glawion, Rudolf; Gruessy, Ernst; Hitz, Peter; Oetterli, Kurt; Seidl, Hans; and Stoeckli, Hans, to Inventio AG. Speed limiting device for lifts or the like. 4,006,799, Cl. 187-38.000.

Blackman, Kent Gordon: *See—*
VanSon, Darryl Jay; and Blackman, Kent Gordon, 4,007,348.

Blackstone Corporation: *See—*
Antonevich, John N., 4,007,119.

Blahak, Johannes; Muller, Erwin; and Kleimann, Helmut, to Bayer Aktiengesellschaft. Aromatic diamines. 4,007,239, Cl. 260-455.00R.

Blatter, Johannes Reinier: *See—*
van Stratum, Antonius Johannes Alberta; van Os, Johannes Gerardus; Blatter, Johannes Reinier; and Zalm, Pieter, 4,007,393.

Blechschmitt, Kurt; Wirth, Friedrich; Hornberger, Paul; Reuter, Peter;

and Buerger, Gert, to BASF Aktiengesellschaft. Supported catalyst for the oxidation of o-xylene and/or naphthalene to phthalic anhydride. 4,007,136, Cl. 252-476.000.

Blessum, Norman Stephen: *See—*
Behr, Michael Isaac; Blessum, Norman Stephen; and Iwan, Wilfred Dean, 4,007,493.

Blinow, Igor; Johnson, Bruce K.; and Whiteside, George D., to Polaroid Corporation. Trim control apparatus for photographic exposure control system. 4,007,468, Cl. 354-59.000.

Blumcraft of Pittsburgh: *See—*
Horgan, William J., Jr., 4,006,768.

Bobeck, Andrew Henry, to Bell Telephone Laboratories, Incorporated. Magnetic bubble, field-access memory having offset propagate element design. 4,007,447, Cl. 340-174.0TF.

Bocharova, Svetlana Lepnidovna: *See—*
Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Lepnidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 4,007,317.

Bodenrader, Frederick F.: *See—*
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Boehringer Mannheim G.m.b.H.: *See—*
Heinemann, Helmut; and Rothe, Werner, 4,007,052.

Boeing Company, The: *See—*
Boone, Jimmie H.; and Simpson, Robert D., 4,006,870.
DeVlieg, Garrett H., 4,006,941.
Foster, Gene B., 4,006,617.
McGee, James Monroe, 4,006,874.
Simpson, Robert D., 4,006,871.
Vogele, Bruno Joseph, 4,006,869.

Bogri, Tibor: *See—*
Abraham, Nedumparambil A.; Bagli, Jehan F.; and Bogri, Tibor, 4,007,171.

Bolick, Fred C., Jr.; and Fleming, Ronald F., to Lanier Business Products, Inc. Dictation-transcription method and system. 4,007,491, Cl. 360-74.000.

Bom, Cornelis Johannes Gerardus: *See—*
van der Lely, Ary; and Bom, Cornelis Johannes Gerardus, 4,006,781.

Bonafous, Maurice, to Applications Mecaniques et Robinetterie Industrielles A.M.R.I. Equipment for bottom loading of liquid products. 4,006,761, Cl. 141-94.000.

Bonafous, Maurice, to Applications Mecaniques et Robinetterie Industrielle A.M.R.I. Butterfly valve of large diameter. 4,006,882, Cl. 251-306.000.

Bonanno, Anthony J.: *See—*
Greenfield, Charles; Casparian, Robert E.; and Bonanno, Anthony J., 4,007,094.

Bondarenko, Raisa Ivanovna: *See—*
Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Lepnidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 4,007,317.

Bonifay, Andre. Stretcher holder device for ambulances. 4,006,500, Cl. 5-82.00R.

Bonnace, Jean Claude: *See—*
Harrow, Charles Lawrence; Bonnace, Jean Claude; and Wilkens, Gunter Gerd, 4,006,977.

Bonyhard, Peter Istvan; Chen, Yu-Ssu; and Smith, James Lanson, to Bell Telephone Laboratories, Incorporated. Magnetic bubble memory organization. 4,007,453, Cl. 340-174.0TF.

Boone, Jimmie H.; and Simpson, Robert D., to Boeing Company, The. Self-aligning roll out guidance system. 4,006,870, Cl. 244-184.000.

Borden Products Limited: *See—*
Chan, Lock-Lim; and Guitard, Arthur Herbert, 4,007,084.

Boreback, Stig Bertil. Fastening device for wings, specially for windows or doors. 4,006,926, Cl. 292-262.000.

Borg-Warner Corporation: *See—*
Burroughs, James E., 4,007,252.
Hechenbleikner, Ingenuin, 4,007,229.
Poklacki, Erwin Sigmund, 4,007,128.
Woerlee, Constantijn L., 4,006,993.

Borowski, Kurt: *See—*
Wagensonner, Eduard; Borowski, Kurt; and Knauer, Dieter, 4,007,467.

Bosch-Siemens Hausgerate GmbH: *See—*
Ballarin, Jurgen; and Mattig, Peter, 4,006,601.

Bossaert, Jean, to Thomson-CSF. High-speed ultrasonic echo-tomographic device. 4,006,627, Cl. 73-67.80S.

Bourgery, Guy R.: *See—*
Fauran, Claude P.; Bourgery, Guy R.; Raynaud, Guy M.; and Dorme, Nicole A. M., 4,007,187.

Bowen, James H., to BDH, Inc.(Entire). Oxidation and ozonation chamber. 4,007,120, Cl. 210-120.000.

Bowers, Wayne E. Odor control compositions for use in chemical toilet systems. 4,007,262, Cl. 424-76.000.

Bowles, Arnold G.; Crum, Andrew S. D.; and Speicher, Melvin E., to National Forge Company. Furnace assembly. 4,007,325, Cl. 13-22.000.

Branson Ultrasonics Corporation: *See—*
Denslow, Clark A., 4,006,707.

Brantley, James W.; and Irwin, Thomas P., to United States of America, National Aeronautics and Space Administration. Leading edge protection for composite blades. 4,006,999, Cl. 416-224.000.

Bridgestone Tire Company Limited: *See—*
Takayanagi, Toshiaki; Tsubakihara, Hiroaki; and Fukuyama, Hiroshi, 4,006,766.
Takayanagi, Toshiaki; Tsubakihara, Hiroaki; and Fukuyama, Hiroshi, 4,007,069.

Briggs and Stratton Corporation: *See—*
Rubner, Hugo G.; and Spreng, Robert R., 4,006,616.

Brinkmann, Jurgen; and Franke, Hermann, to Varta Batterie Aktiengesellschaft. Battery cell cooling system. 4,007,315, Cl. 429-62.000.

British Petroleum Company Limited, The: *See—*
Thurgood, Garry, 4,007,380.

British Steel Corporation: *See—*
Eadie, Gordon Cunningham; and Hinsley, Christopher Frederick, 4,006,734.

Bromberg, Michael Arnold; Fletcher, William E.; Morley, Richard E.; and Schwenk, George G., to Termiflex Corporation. Hand-held interactive terminal. 4,007,443, Cl. 340-172.500.

Brooks, Richard Donald, to Bell Telephone Laboratories, Incorporated. Noninverting current-mode logic gate. 4,007,384, Cl. 307-218.000.

Brown, Alvin E.; and Fick, Willy J., to Danfoss A/S. Automatic gain control of pulses. 4,007,428, Cl. 330-129.000.

Brown, Leonard Rudolph. Manual radiator rodder. 4,006,508, Cl. 15-104.050.

Brown, Wilburn Kelly, to Pettibone Corporation. Steering system including tandem hydraulic cylinders with self-synchronization. 4,006,664, Cl. 91-171.000.

Brown & Williamson Tobacco Corporation: *See—*
Snediker, Robert R.; Chalmers, Steve; and Drapeau, Robert E., 4,006,824.

Brusius, Phillip G.: *See—*
Ansell, Joseph L.; Brusius, Phillip G.; and Baker, Raymond J., 4,007,296.

Buathier, Bernard; Combes, Andre; Pierrot, Francois; and Guerpillon, Henri, to Rhone-Poulenc Industries. Process for the manufacture of carbon oxysulfide. 4,007,254, Cl. 423-416.000.

Bublitz, Arthur T.; and Jakes, Gerald A., to Reliance Electric Company. Electronically controlled glassware-forming machine. 4,007,028, Cl. 65-163.000.

Bucher-Guyer AG: *See—*
Hartmann, Eduard, 4,006,642.

Buckley, David A.; Ciccarelli, Roger N.; and Belli, Frank G., to Xerox Corporation. Migration imaging method. 4,007,042, Cl. 96-1.0PS.

Buckley, David A., to Xerox Corporation. Preparation of red amorphous selenium. 4,007,255, Cl. 423-510.000.

Buerger, Gert: *See—*
Blechschmitt, Kurt; Wirth, Friedrich; Hornberger, Paul; Reuter, Peter; and Buerger, Gert, 4,007,136.

Bugaut, Andree: *See—*
Kalopissis, Gregoire; and Bugaut, Andree, 4,007,228.

Buildex Incorporated: *See—*
Sekerich, Michael, 4,006,945.

Bulson, Walter T.; Hartranft, George R.; and Ray, Leonard N., Jr., to Armstrong Cork Company. Product and method of printing carpet with a transfer paper- II. 4,007,003, Cl. 8-2.50A.

Bunce, Roger Abraham: *See—*
Greaves, Geoffrey Stuart; and Bunce, Roger Abraham, 4,007,011.

Bunch, G. W.: *See—*
Laurie, Albert F.; and Bunch, G. W., 4,006,678.

Bundschuh, Albert, to Zahnradfabrik Friedrichshafen AG. Steering system with auxiliary power assist. 4,006,792, Cl. 180-143.000.

Bunker Ramo Corporation: *See—*
Abler, Norman C., 4,006,609.
Flanagan, Robert C., 4,007,331.
Winters, Michael G., 4,007,330.

Burghoff, Karl: *See—*
Meyer, Ernst; and Burghoff, Karl, 4,006,673.

Burgoon, Jack L., to Scott & Fetzer Company, The. Surface cleaning machine with squeegee assembly. 4,006,506, Cl. 15-50.00R.

Burkey, John K.: *See—*
McClain, Herbert D.; Parikh, Bipin D.; and Burkey, John K., 4,007,329.

Burkhardt, Gottfried: *See—*
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Burley, John Charles. Inductive method for cutting cloth. 4,007,349, Cl. 219-10.430.

Burroughs Corporation: *See—*
Behr, Michael Isaac; Blessum, Norman Stephen; and Iwan, Wilfred Dean, 4,007,493.
Faber, Ulbe, 4,007,441.
Semmelhaack, Carl Frederick; and Divecchio, Mark Camillo, 4,007,439.
Sims, Dewey McKinley, Jr., 4,006,661.

Burroughs, James E., to Borg-Warner Corporation. Stabilized sodium aluminate solutions. 4,007,252, Cl. 423-265.000.

Bursk, William M., to Pease Company. Mounting assembly with improved fastener. 4,006,571, Cl. 52-498.000.

Burton, Gilbert W.; and O'Farrell, Charles P., to Exxon Research and Engineering Company. Process for preparing latices of sulfonated elastomers. 4,007,149, Cl. 260-29.70B.

Busdiecker, Wayne S., to Parker-Hannifin Corporation. Method of constructing a hose. 4,007,070, Cl. 156-143.000.

Butter, Stephen Allan, to Mobil Oil Corporation. Selective production of para-xylene. 4,007,231, Cl. 260-672.00T.

Buzza, Edmund E.; and Lillig, John E., to Beckman Instruments, Inc. Electrode module for titration apparatus. 4,007,105, Cl. 204-195.00T.

Cadalora, Fulvio; and Ferrari, Pietro, to GTE International Incorporated. Phase-locked loop having a switched lowpass filter. 4,007,429, Cl. 331-17.000.

Cailloux, Paul, to Promecam Sisson-Lehmann. Positioning device. 4,006,623, Cl. 72-461.000.

Cain, Charles; and Shankle, Arthur T., to Cain, Charles J. Apparatus for remotely determining the angular orientation, speed, and/or direction of rotation of objects. 4,007,454, Cl. 340-200.000.

Cain, Charles J.: *See—*
Cain, Charles; and Shankle, Arthur T., 4,007,454.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defense: *See—*
McMahon, Garfield W., 4,007,436.

Canadian National Railway Company: *See—*
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Canadian Patents and Development Limited: *See—*
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Canon Denshi Kabushiki Kaisha: *See—*
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Canon Kabushiki Kaisha: *See—*
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Nakamura, Zenzo; Ohtaki, Shohei; Uchiyama, Takashi; and Yokota, Hideo, 4,007,398.
Yoshida, Shigeru, 4,006,507.

Carlson, Richard D.: *See—*
Duffy, James J.; Carlson, Richard D.; and Watson, James C., 4,007,236.

Carlyon, Richard A., Jr. Self-irrigating display rack for potted plants. 4,006,559, Cl. 47-39.000.

Carnahan, Robert D.: *See—*
Rossi, Ronald C.; and Carnahan, Robert D., 4,007,049.

Carroll, Frank E., to Decks, Incorporated. Building deck construction. 4,006,731, Cl. 126-271.000.

Carter, Ivor W., to Chrysler Corporation. Arrangement for mounting electronic circuit boards on an engine-air intake structure. 4,006,724, Cl. 123-198.00E.

Carver, Richard N.: *See—*
Lohr, Raymond J.; Carver, Richard N.; Kienholz, Charles M.; Cook, Calvin S.; and Rogers, Maxmillian P., 4,006,899.

Cascade Pole Company: *See—*
McClain, Stephen A.; Doman, Harvey A.; and Entus, Richard D., 4,007,075.

Casella, Frank P. Clock housing and decorative means therefor. 4,006,586, Cl. 58-53.000.

Casparian, Robert E.: *See—*
Greenfield, Charles; Casparian, Robert E.; and Bonanno, Anthony J., 4,007,094.

Caterpillar Mitsubishi Ltd.: *See—*
Nishino, Shigeru; and Uchida, Tomio, 4,006,782.

Caterpillar Tractor Co.: *See—*
Anderson, Reynold M.; and Tullar, Donald E., 4,006,834.
Bianchetta, Donald L.; Lohbauer, Kenneth R.; and Rhodes, Sammy J., 4,006,667.
Gibble, Lawrence W.; and Keesey, Dennis Lee, 4,006,943.
Keske, Frank E., 4,006,797.
Liehr, Douglas P.; and Drochner, Erich E., 4,006,917.
Schexnayder, Lawrence Francis, 4,006,939.
Starling, James G.; Wait, Jay J.; and Riediger, Craig W., 4,006,808.
Stepe, Visvaldis A., 4,006,544.

Cathriner, Richard L., to Atlantic Richfield Company. Well testing apparatus. 4,006,630, Cl. 73-155.000.

Cawley, William E.; and Frantz, Charles E., to United States of America, Energy Research and Developmnent Administration. Manipulator for hollow objects. 4,006,930, Cl. 294-93.000.

Centre Electronique Horloger S.A.: *See—*
Vuilleumier, Raymond, 4,006,583.

Cerefice, Steven A.; and Fields, Ellis K., to Standard Oil Company (Indiana). Dicyclohexadiene tetraacyl compounds. 4,007,214, Cl. 260-468.00G.

Cermat: *See—*
Khoi, Danny James, 4,006,635.

Cerny, Ronald Neal: *See—*
Sadler, Thomas Harry; and Cerny, Ronald Neal, 4,006,920.

Cervenka, Kenneth G., to Faith Industries, Inc. Jet reaction turbine with rotating combustor for burning slurry fuels. 4,006,591, Cl. 60-39.350.

Cesa, Valentin. Fireplace. 4,006,729, Cl. 126-121.000.

Ceskoslovenska akademie ved: *See—*
Fencl, Zdenek; Machek, Frantisek; and Sillinger, Vladimir, 4,007,088.

Cestone, Frank J.: *See—*
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CGR Medical Corporation: *See—*
Harrow, Charles Lawrence; Bonnace, Jean Claude; and Wilkens, Gunter Gerd, 4,006,977.

Chaiet, Louis; Hernandez, Sebastian; and Zimmerman, Sheldon B., to Merck & Co., Inc. Novel fermentation process for the preparation of Sulfomycin. 4,007,090, Cl. 195-80.00R.

Chalmers, Steve: *See—*
Snediker, Robert R.; Chalmers, Steve; and Drapeau, Robert E., 4,006,824.

Chambolle, Jacques Andre Louis Marie, to Compagnie Honeywell Bull (Societe Anonyme). Arrangement for fitting and tensioning an endless character-bearing band in a printer. 4,006,682, Cl. 101-111.000.

Chan, Lock-Lim; and Guitard, Arthur Herbert, to Borden Products Limited. Dry strength paper and process therefor. 4,007,084, Cl. 162-167.000.

Chapron, Claude, to U.S. Philips Corporation. Serially-connected circuit groups for intergrated injection logic. 4,007,385, Cl. 307-296.000.

Charlot, Guy, to Essilor International (Compagnie Generale d'Optique). Machine for machining two faces of an ophthalmic lens. 4,006,563, Cl. 51-109.00R.

Chase, Erin O. Mop holder. 4,006,509, Cl. 15-150.000.

Chaudhary, Kailash Chandra, to International Business Machines Corporation. System for self-cleaning ink jet head. 4,007,465, Cl. 346-140.00R.

Chemische Werke Huls Aktiengesellschaft: *See—*
Schleicher, Rudolf; Walther, Juergen; Schoenberg, Karl-Heinz; and Rauth, Peter, 4,007,022.

Chen, Yu-Ssu: *See—*
Bonyhard, Peter Istvan; Chen, Yu-Ssu; and Smith, James Lanson, 4,007,453.

Cheng, Paul J.: *See—*
Schirmer, Robert M.; Vanderveen, John W.; and Cheng, Paul J., 4,007,001.

Cherry, Isaac Raymond, to Del Mar Engineering Laboratories. Electrocardiographic computer. 4,006,737, Cl. 128-2.06G.

Chevron Research Company: *See—*
Franke, Hans Georg, 4,007,175.
Singer, Malcolm Scott, 4,007,033.

Chierici, Osvaldo F., to Holland Company. Hopper car outlet gate and seal. 4,006,692, Cl. 105-282.00P.

Chiu, Ya-Chang: *See—*
Valfells, August; and Chiu, Ya-Chang, 4,007,392.

Choay, Jean, to Choay S.A. Pharmaceutical composition containing vitamin B_{12}, process of making the same and method of treatment. 4,007,266, Cl. 424-105.000.

Choay S.A.: *See—*
Choay, Jean, 4,007,266.

Chodorow, Ingram S., to Placontrol Inc. Disposable flosser. 4,006,750, Cl. 132-91.000.

Chorvat, Robert J.; and Pappo, Raphael, to G. D. Searle & Co. Process and intermediates for manufacture of 2-azasterioids. 4,007,194, Cl. 260-289.0AZ.

Chow, Che Chung, to Xerox Corporation. Electrophotographic printing method. 4,007,041, Cl. 96-1.0LY.

Christensen, Jorgen Anders; and Squires, Richard Felt, to A/S Ferrosan. 4-Phenylpiperidine compounds. 4,007,196, Cl. 260-293.580.

Christensen, Thorkild: *See—*
Baatrup, Johannes Vagn; and Christensen, Thorkild, 4,006,663.

Chrysler Corporation: *See—*
Carter, Ivor W., 4,006,724.

Chu, Joseph Y. C.; and Gunther, W. H. H., to Xerox Corporation. Process for preparation of solid phase dispersion of photoconductive materials. 4,007,100, Cl. 204-158.00R.

Chu, Joseph Y. C.; and Gunther, Wolfgang H. H., to Xerox Corporation. Process for preparation of solid phase dispersion of photoconductive materials. 4,007,101, Cl. 204-158.00R.

Church, Peter K.; and Knutson, Oliver J., to Kaman Sciences Corporation. Refractory abrasive body containing chromium oxide and method of producing it. 4,007,020, Cl. 51-295.000.

Ciambrone, David Fred, to Cubic Corporation. Ozone oxidation of waste water. 4,007,118, Cl. 210-63.00Z.

Ciba-Geigy AG: *See—*
Garner, Robert; and Petitpierre, Jean Claude, 4,007,195.

Ciba-Geigy Corporation: *See—*
Berrer, Dagmar, 4,007,032.
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Ramey, Chester E.; and Luzzi, John J., 4,007,157.

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Cincinnati Milacron-Heald Corporation: *See—*
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Cities Service Company: *See—*
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Citizen Watch Co., Ltd.: *See—*
Hashimoto, Shingo; Nishikubo, Yasuhiko; Ebihara, Heihachiro; and Fukayama, Hiroyuki, 4,006,584.
Tamaru, Munetaka; Kume, Kazunari; Watanabe, Minoru; and Ohno, Hideshi, 4,006,585.
Tokunaga, Yoshio, 4,006,829.

Clapham, Peter Brian; and Hutley, Michael Christopher, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Industry in Her Britannic Majesty's Government of the. Apparatus for storing energy from electromagnetic radiation. 4,006,730, Cl. 126-271.000.

Clark Equipment Company: *See—*
Zeller, Burton S.; and Sisson, Ronald L., 4,006,805.
Clark, George C.: *See—*
Stultz, Frederick L.; and Clark, George C., 4,006,789.
Clarke, Barry John; Kershaw, Robert William; and Lubbeck, Frederick John, to Balm Paints Limited. Amine resin and process. 4,007,142, Cl. 260-2.50F.
Clarke, John T.; Harker, Royce K.; Hittmeier, Michael E.; and Eaton, James W., to Masonite Corporation. Post-press embossing of a consolidated man-made board. 4,007,076, Cl. 156-62.800.
Clean Air Company, Inc.: *See—*
Graffman, Johan Holger, 4,007,000.
Clemar Manufacturing Corporation: *See—*
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Coal Industry (Patents) Limited: *See—*
Gapper, Terence John; Addison, George Thomas; and Tate, David Arthur, 4,006,935.
Smith, Job Frederick; and O'Neill, Owen, 4,006,875.
Coehorst, Robert Francois, to U.S. Philips Corporation. Earpiece which substantially consists of a thin-walled flexible capsule filled with a liquid medium. 4,006,796, Cl. 181-130.000.
Coffman, Robert B., to Norman Dryer Co., Inc. Variable air supply for fabric dryers. 4,006,534, Cl. 34-54.000.
Cohen, Arthur I.; Sim, James S. Y.; Van Horn, Maurice H.; Gordesky, Stanley E.; and Gordon, Stanley I., to Union Corporation. Sustained release pesticidal composition. 4,007,258, Cl. 424-22.000.
Colgate-Palmolive Company: *See—*
Bauman, Robert Andrew, 4,007,281.
Patino, Armando; and Maldonado, Bernardo, 4,007,259.
Coll, Antonio Luis Palomo. Process for preparing penicillins derivatives. 4,007,168, Cl. 260-239.100.
Collier, Everett Joshua; and Morrow, John Edward, to Procter & Gamble Company, The. Process for preparing a silicate-pyrophosphate detergent composition. 4,007,124, Cl. 252-109.000.
Collumeau, Yoland, to Thomson-CSF. Semiconductor switching device. 4,007,475, Cl. 357-39.000.
Columbia Chemical Corporation: *See—*
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Combes, Andre: *See—*
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Communications Patents Limited: *See—*
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Compagnie de Construction Mechanique Sulzer: *See—*
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Compagnie Honeywell Bull (Societe Anonyme): *See—*
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Compagnie Industrielle des Telecommunications Cit-Alcatel: *See—*
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Friberg, Jean; and Merigoux, Jean-Marie, 4,006,997.
Sourgens, Jacques; Lajotte, Dominique; and Michelon, Francois, 4,007,341.
Concast AG: *See—*
Koenig, Peter J., 4,006,772.
Connor, David T.; Young, Patricia A.; and von Strandtmann, Maximilian, to Warner-Lambert Company. Substituted 3-(2-pyridinyl)-4(1H)-quinolinone N-oxides. 4,007,193, Cl. 260-288.0CE.
Connor, David T.; and von Strandtmann, Max, to Warner-Lambert Company. 7-Substituted-9-oxoxanthene-2-carboxaldehydes. 4,007,205, Cl. 260-335.000.
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Consolidated Cigar Corporation: *See—*
Horowitz, Carl; Dichter, Michael; Abrams, Nathan; and Mangaraj, Duryodhan, 4,006,749.
Consolidated Devices, Inc.: *See—*
Vuceta, Ivan N., 4,006,608.
Consonni, Pietro: *See—*
Sale, Amedeo Omodei; Consonni, Pietro; and Lerner, Leonard J., 4,007,276.
Continental Gummi-Werke Aktiengesellschaft: *See—*
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Contraves AG: *See—*
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Control Data Corporation: *See—*
Hennenfent, Douglas J.; Johnson, Robert A.; and Jutila, Raymond Eino, 4,006,525.
Cook, Calvin S.: *See—*
Lohr, Raymond J.; Carver, Richard N.; Kienholz, Charles M.; Cook, Calvin S.; and Rogers, Maxmillian P., 4,006,899.
Coolidge, Anson S.: *See—*
Pfouts, Robert R.; Coolidge, Anson S.; and Peter, Daryl D., 4,006,776.
Copal Company Limited: *See—*
Ishiguro, Yasuo, 4,006,976.
Corbellini, Glauco. Segmental sail for boats. 4,006,701, Cl. 114-102.000.
Cornelius, Gail; and Olson, Lloyd C., to R. M. Wade & Co. Method and apparatus for transporting an irrigation line. 4,006,860, Cl. 239-212.000.
Corning Glass Works: *See—*
Olshansky, Robert, 4,006,962.
Corris, Charles James, to Risdon Manufacturing Company, The. Apparatus for operating an aerosol container. 4,006,844, Cl. 222-70.000.
Cotton, Incorporated: *See—*
Wilkes, Lambert H.; Underbrink, Gary L.; and Jones, Joseph K., 4,006,814.
Coucher, Robert G., to EPPCO. Indexing powder dispensing device. 4,006,846, Cl. 222-194.000.
Coulter Information Systems, Inc.: *See—*
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Courboulay, Pierre: *See—*
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Cousin, Alain, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Apparatus for selectively altering image data for CRT display in order to facilitate image analysis. 4,007,327, Cl. 358-160.000.
Crabiel, Wesley Irving, to Dresser Industries, Inc. Rotary cutter for a road planer. 4,006,936, Cl. 299-39.000.
Craft, William J.; and Williams, Carroll B. Shot dispersion control device for shotgun shells. 4,006,688, Cl. 102-42.00R.
Craftor Inc.: *See—*
Paige, Roy C.; and Wright, Jonathan B., 4,007,456.
Cramer, John J.: *See—*
Kakar, Sarwan K.; Kappler, Frank R.; Gomes, Gilbert S.; and Cramer, John J., 4,007,305.
Cramer, Josef; and Hannen, Willi, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Apparatus for producing nuclear reactor particles. 4,006,848, Cl. 222-309.000.
Creighton, Stephen M.: *See—*
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Cremeal S.A.: *See—*
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Cretin, Jacques: *See—*
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Crisan, Eli V.; and Sorensen, Steven G., to University of California, The Regents of the. Production and utilization of lactase. 4,007,283, Cl. 426-34.000.
Cronin, Timothy H.; and Richardson, Kenneth, to Pfizer Inc. Substituted alkyl esters of quinoxaline-di-N-oxide-2-carboxylic acid. 4,007,184, Cl. 260-250.0QN.
Cross, David L., to Atco Manufacturing Co., Inc. Miniature animal-watering valve. 4,006,716, Cl. 119-72.500.
Crouch, William B.: *See—*
Slater, William L.; Richter, George N.; Crouch, William B.; and Estabrook, Lawrence E., 4,007,017.
Slater, William L.; Richter, George N.; Crouch, William B.; and Estabrook, Lawrence E., 4,007,018.
Slater, William L.; Richter, George N.; Crouch, William B.; and Estabrook, Lawrence E., 4,007,019.
Crovetti, Aldo Joseph: *See—*
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Crownover, Glen D., to Malm Fireplaces, Inc. Free standing fireplace for mobile homes. 4,006,733, Cl. 126-143.000.
Crum, Andrew S. D.: *See—*
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Cubic Corporation: *See—*
Ciambrone, David Fred, 4,007,118.
Culver, Charles V. Humidifiers for forced air systems. 4,006,674, Cl. 98-105.000.
Cummings, John S., to Aladdin Industries, Incorporated. Convertible stopper for a wide mouth thermos. 4,006,835, Cl. 215-13.00R.
Cunningham, Patrick J. Fishing lure. 4,006,552, Cl. 43-42.480.
Curtis, Brian Matthew, to Perard Engineering Ltd. Carriage especially for use in mines. 4,006,937, Cl. 299-43.000.
Curtis, Harris L., to Polaroid Corporation. Novel amide compounds. 4,007,212, Cl. 260-404.500.
Cuschera, Casper. Adapter for bathtub drain. 4,006,498, Cl. 4-191.000.
Cyprus Specialty Steel: *See—*
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Kappes, Joseph L.; Munch, Walter, Jr.; and Uetrecht, Dale M., 4,006,658.
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Danfoss A/S: *See—*
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Daniel Woodhead, Inc.: *See—*
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Darsie, Burns, to Barber-Colman Company. Locked toggle beater drive for triaxial weaving machine. 4,006,759, Cl. 139-191.000.
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Dattilo, Donald J., to Motorola, Inc. Two piece sheet metal capstan housing assembly method. 4,006,522, Cl. 29-407.000.
Davis, James Alvin: *See—*
Witherspoon, Romeo Richard; Domanski, Edward Marion; and Davis, James Alvin, 4,007,059.
Davis, Thomas J., to Battelle Memorial Institute. Amplitude sorting of oscillatory burst signals by sampling. 4,006,625, Cl. 73-71.400.
Dawson, Robert H.; and McGrath, James L., to Reliable Electric Company. Concrete form assembly. 4,006,878, Cl. 249-43.000.
De Staat der Nederlanden, te Dezen Vertegenwoordigd Door de Directeur-Generaal der Posterijen, Telegrafie en Telefonie: *See—*
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Decker, Wilton K., to Safe-Lite, Inc. Warning light security device. 4,006,614, Cl. 70-63.000.
Decks, Incorporated: *See—*
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Deering Milliken Research Corporation: *See—*
Ruppe, Charles R., 4,006,516.
de Keyzer, Cornelius J., to Rank Xerox Ltd. Camming system. 4,006,648, Cl. 74-568.00R.
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De Martino, Roberto, to Ecodyne Corporation. Method for precoating a filter with a mixture of anion and cation exchange resin particles. 4,007,301, Cl. 427-244.000.
De Mund, Fred W. Drive-up service arrangement for banks, and the like. 4,006,798, Cl. 186-1.00C.
Denboer, Anthony J.: *See—*
Elmer, Ben R.; Tchon, Wallace E.; and Denboer, Anthony J., 4,007,446.
Denslow, Clark A., to Branson Ultrasonics Corporation. Ultrasonic coating apparatus. 4,006,707, Cl. 118-612.000.
Descamps, Marcel; and Gubin, Jean, to Labaz. Benzothiophene compounds and the production and use thereof. 4,007,204, Cl. 260-330.500.
Deutsche Babcock & Wilcox Aktiengesellschaft: *See—*
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Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
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Kropp, Rudolf, 4,007,040.
Laufer, Siegmar; and Waldemar, Roy, 4,007,050.
De Vale, Donald P., to Everpure, Inc. Control for fluid flow system. 4,006,752, Cl. 137-101.210.
Deverell, Harry E., to Allegheny Ludlum Industries, Inc. Pitting resistant stainless steel alloy having improved hot-working characteristics. 4,007,038, Cl. 75-122.000.
DeVlieg, Garrett H., to Boeing Company, The. Aircraft brake control system having hydroplaning protection. 4,006,941, Cl. 303-103.000.
de Vries, Hans: *See—*
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Dichter, Michael: *See—*
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Dick, G. John, to United States of America, Navy. Method for microwave transmission of energy with superconducting apparatus. 4,006,597, Cl. 60-721.000.
Dickinson, Robert V. C., to Intech Laboratories, Inc. System and apparatus for electronic spectral analysis. 4,007,423, Cl. 325-67.000.
Dickson, George; and Westergaard, Robert K., to King-Seeley Thermos Co. Ice making machine. 4,006,605, Cl. 62-356.000.
Diesel Kiki Co., Ltd.: *See—*
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DiLaurenzio, Anthony. Revolving exercising device. 4,006,895, Cl. 272-67.000.
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Semmelhaack, Carl Frederick; and Divecchio, Mark Camillo, 4,007,439.
DiVito, Joseph A. Magnetic baseball, bat and glove. 4,006,900, Cl. 273-95.00R.
Dmitriev, Vladimir Alexandrovich: *See—*
Levin, Felix Lvovich; Golovanenko, Sergei Alexandrovich; and Dmitriev, Vladimir Alexandrovich, 4,007,073.
Dr. Ing. Gottschol Metallurgie Kommanditgesellschaft: *See—*
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Doilov, Svyatoslav Kirillovich; Efimov, Viktor Mikhailovich; Ioonas, Rikhard Eduardovich; Nazinin, Nikolai Andreevich; Piik, Enn Edgarovich; Raad, Khans Eduardovich; Roox, Ivar Kharaldovich; Serebryannikov, Nikolai Dmitrievich; Shaganov, Jury Vasilievich; Ananiev, Leonid Semenovich; and Volkov, Alexei Sergeevich. Furnace for thermal processing of lump solid fuel. 4,007,093, Cl. 202-121.000.
Doman, Harvey A.: *See—*
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Domanski, Edward Marion: *See—*
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Dorer, Wilfried: *See—*
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Dounchis, Harry, to FMC Corporation. Organic substrates stabilized by nitroalkane based hindered phenol compounds. 4,007,159, Cl. 260-45.90E.
Dow Chemical Company, The: *See—*
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Freedman, Harold H.; McGregor, Stanley D.; Yoshimine, Masao; and Kroposki, Lorraine M., 4,007,197.
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Dresser Industries, Inc.: *See—*
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DuCharme, Donald W.; and Skaletzky, Louis L., to Upjohn Company, The. Adamantyl containing guanidines. 4,007,181, Cl. 260-247.50R.
Dudek, Edmund C., to Thor Power Tool Company. Fluid operated power tool. 4,006,784, Cl. 173-12.000.
Duffy, James J.; Carlson, Richard D.; and Watson, James C., to Hooker Chemicals & Plastics Corporation. Brominated phosphoramidates. 4,007,236, Cl. 260-927.00R.
Dun-Hot, Inc.: *See—*
Maier, Gary W.; and Jehn, David H., 4,007,285.
Dunn, James L., Jr.; Ward, John K.; and Martin, Patrick H., to Dow Chemical Company, The. Method for coating surfaces. 4,007,304, Cl. 427-314.000.
Dunnette, Harry. Stringed musical instruments. 4,006,657, Cl. 84-314.000.
Dunning, Richard E., to Avery Products Corporation. Method for making and using hot stamp tape. 4,007,067, Cl. 156-61.000.
Dynamic Industries, Inc.: *See—*
Alten, Ralph W., 4,006,641.
Alten, Ralph W., 4,007,343.
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E. R. Squibb & Sons, Inc.: *See—*
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Eastman Kodak Company: *See—*
Gaugh, Wilbur Seth; Heseltine, Donald Warren; Sturmer, David Michael; and Freeman, John Paul, 4,007,170.
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Eaton, James W.: *See—*
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Ebert, Edward A. Device for heating thermoplastic eyeglass frames. 4,007,370, Cl. 219-521.000.

Ebihara, Heihachiro: *See—*
Hashimoto, Shingo; Nishikubo, Yasuhiko; Ebihara, Heihachiro; and Fukayama, Hiroyuki, 4,006,584.

Ecodyne Corporation: *See—*
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Econocorp, Inc.: *See—*
Lee, Richard G., 4,006,575.

Edison Control Corporation: *See—*
Russell, Taft B., 4,007,340.

Edmondson, Morris S., to Petro-Tex Chemical Corporation. Method of polymerizing chloroprene using conjugated long-chain fatty acids as emulsifiers. 4,007,145, Cl. 260-23.70H.

Edwards, John. Surgical knife. 4,006,746, Cl. 128-305.000.

Edwards, Roy Ernest, to Girling Limited. Master cylinder assembly for a vehicle hydraulic braking system. 4,006,593, Cl. 60-581.000.

Effic Trading and Services Ltd.: *See—*
Egosi, Isaac, 4,006,679.

Efimov, Viktor Mikhailovich: *See—*
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Egosi, Isaac, to Effic Trading and Services Ltd. Opposed box baling press. 4,006,679, Cl. 100-138.000.

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Kulbakh, Valter Osvaldovich; Kokushina, Tatyana Mikhailovna; Lagert, Irina Kondratievna; Mikhailets, Georgy Avxentievich; Kholodova, Galina Vasilievna; Ekzemplyarov, Oleg Nikolaevich; Zelmanov, Ruvim Bentsionovich; Sokolov, Leonid Borisovich; Etingov, Evgeny Davidovich; and Lushitskaya, Irina Mikhailovna, 4,007,166.

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Eli Lilly and Company: *See—*
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Elliott, Benjamin P. Safety matchbook having interlocking cover panels. 4,006,819, Cl. 206-104.000.

Elliott, Roger Michael, to B S P International Foundations Limited. Soil compacting devices. 4,006,886, Cl. 259-1.00R.

Elmer, Ben R.; Tchon, Wallace E.; and Denboer, Anthony J., to Honeywell Information Systems, Inc. Multiphase series-parallel-series charge-coupled device registers. 4,007,446, Cl. 340-173.00R.

Elmer, James W., to Inventors Engineering, Inc. Single shaft programming control for machine tools. 4,006,649, Cl. 74-568.00R.

Elmer, James W., to Inventors Engineering, Inc. Indexing control for rotatable part on a machine tool. 4,006,650, Cl. 74-813.00C.

Emanuel, Carl F., deceased; and Emanuel, Mary Victoria, administratrix. Process for preparing uric acid. 4,007,186, Cl. 260-255.000.

Emanuel, Mary Victoria, administratrix: *See—*
Emanuel, Carl F., deceased; and Emanuel, Mary Victoria, administratrix, 4,007,186.

Emmons, Donald R. Dry granular feeder. 4,006,888, Cl. 259-18.000.

Engels, Kaspar, to Draiswerke GmbH. Device for continuous coating of fibers. 4,006,887, Cl. 259-9.000.

England, Donald E.; Giordano, George P.; Thompson, Garland C.; and Wright, James J., to General Mills Fun Group, Inc. Doll with incrementally movable arm. 4,006,555, Cl. 46-119.000.

Entus, Richard D.: *See—*
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EPPCO: *See—*
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Erb, Robert Allan, to Franklin Institute Research Laboratories, The. Method of forming a removable cervical cap. 4,007,249, Cl. 264-222.000.

Erdmann, Kurt: *See—*
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Erickson, Richard Allan: *See—*
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Ericsson, Ronald J., to Gametrics Limited. Sperm fractionation and storage. 4,007,087, Cl. 195-1.800.

Ernstoff, Michael N.; Hoffman, William C.; and Winner, Richard N., to Hughes Aircraft Company. Liquid crystal dot color display. 4,006,968, Cl. 350-160.0LC.

Eskamani, Abolghassem, to Standard Oil Company. Acrylonitrile-acrolein-indene terpolymers. 4,007,162, Cl. 260-73.00R.

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Slater, William L.; Richter, George N.; Crouch, William B.; and Estabrook, Lawrence E., 4,007,019.

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Evans, Anthony C., to Kelsey-Hayes Company. Automatic adjustor for a brake mechanism. 4,006,802, Cl. 188-196.00D.

Everett, George; and Shapcott, Michael, to Zapata Industries, Inc. Automatic feeding hopper. 4,006,812, Cl. 198-347.000.

Everpure, Inc.: *See—*
De Vale, Donald P., 4,006,752.

Evers, William J.; Heinsohn, Howard H., Jr.; Vock, Manfred Hugo; and Giacino, Christopher, to International Flavors & Fragrances Inc. Flavoring with (allyl)(2-methyl-3-furyl) sulfide. 4,007,287, Cl. 426-535.000.

Exxon Research and Engineering Company: *See—*
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Baird, William Chalmers, Jr., 4,007,111.
Bearden, Roby, Jr., 4,007,110.
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Fa. Ingenieur Gunter Klemm Spezialuntrnehmen fur Bohrtechnik: *See—*
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Faber, Ulbe, to Burroughs Corporation. Method of data communications in a heterogenous environment. 4,007,441, Cl. 340-147.00R.

Faith Industries, Inc.: *See—*
Cervenka, Kenneth G., 4,006,591.

Fanberg, Ralph Z. Refrigeration apparatus and method. 4,006,602, Cl. 62-113.000.

Fantuzzo, Joseph, to Xerox Corporation. Half tone development for touchdown system. 4,006,981, Cl. 355-3.0DD.

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Berger, Christian; Farge, Daniel; Gros, Georges; Messer, Mayer Naoum; and Moutonnier, Claude, 4,007,176.

Farina, John. Dispensing mechanism. 4,006,850, Cl. 222-356.000.

Farmery, Horstine, to Horstine Farmery Limited. Spray apparatus. 4,006,858, Cl. 239-7.000.

Farthouat, Anne; and Meier, Jean, to Roussel-UCLAF. N-(quinolyl)-anthranilates, their compositions, and use. 4,007,275, Cl. 424-258.000.

Fauran, Claude P.; Bourgery, Guy R.; Raynaud, Guy M.; and Dorme, Nicole A. M., to Delalande S.A. Furo (2,3d) pyrimidines. 4,007,187, Cl. 260-256.40F.

Fedders Corporation: *See—*
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Feehan, Chester E.; and Wagner, Ernest F., to United States Pipe and Foundry Company. Polyethylene coating for ferrous metals. 4,007,298, Cl. 427-195.000.

Fehr, Henri, to Compagnie de Construction Mechanique Sulzer. Electromagnetically-actuatable rotary vane pump for use as a hydraulic brake. 4,006,804, Cl. 188-293.000.

Feld, Marcel; and Richtzenhain, Hermann, to Dynamit Nobel Aktiengesellschaft. Method of preparing p-nitrobenzoic acid. 4,007,223, Cl. 260-524.00R.

Feldhoff, Hermann-Josef: *See—*
Klein, Willi; Rocholl, Henning; Feldhoff, Hermann-Josef; and Otto, Alfred, 4,006,803.

Feldmann, Joachim; Mann, Arnold; and Heimbach, Ludolf, to VDO Adolf Schindling AG. Device for regulating the traveling speed of a motor vehicle. 4,006,791, Cl. 180-108.000.

Felsher, Edward M. Display device for projecting scenes, win signals, and proportion of win signals. 4,006,904, Cl. 273-138.00A.

Fencl, Zdenek; Machek, Frantisek; and Sillinger, Vladimir, to Ceskoslovenska akademie ved. Process of manufacturing native microbial protein with a low content of nucleic acids. 4,007,088, Cl. 195-4.000.

Ferguson, Thomas A. Window shade assembly. 4,006,770, Cl. 160-263.000.

Ferrari, Pietro: *See—*
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F'Geppert, Erwin, to United States of America, Army. Anti-friction worm and wheel drive. 4,006,646, Cl. 74-425.000.

Fick, Willy J.: *See—*
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Fiege, L. Gail. Circuit card guide. 4,007,403, Cl. 317-101.0DH.

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Findley, Gerald Ivan; and Anderson, Teddy Lee, to International

Business Machines Corporation. Intermixed line heights and blank line formation in a buffered printer. 4,007,442, Cl. 340-172.500.

Firestone Tire & Rubber Company, The: *See—*
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Fischer, Jochen: *See—*
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Fischer, Manfred: *See—*
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Fischer, Martin: *See—*
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Fisher, Phil Dewey; and Hock, Richard Howard, to Bell Telephone Laboratories, Incorporated. Converter utilizing leakage inductance to control energy flow and improve signal waveforms. 4,007,413, Cl. 321-2.000.

Fitztuchverwaltungs-Gesellschaft mit beschrankter Haftung: *See—*
Schuster, Wilhelm; Wollmann, Klaus; and Stahl, Jurgen, 4,007,303.

Flanagan, Robert C., to Bunker Ramo Corporation. Apparatus for demodulation of relative phase modulated binary data. 4,007,331, Cl. 178-88.000.

Flannery, Joe W., to Raymond Lee Organization, Inc., The, a part interest. Movable ceiling device. 4,006,567, Cl. 52-126.000.

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Fleming, Ronald F.: *See—*
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Bernady, Karel Francis; Floyd, Middleton Brawner, Jr.; Poletto, John Frank; Schaub, Robert Eugene; and Weiss, Martin Joseph, 4,007,210.

Fluck, Rene, to SIG Schweizerische Industrie-Gesellschaft. Article separating and conveying system. 4,006,813, Cl. 198-488.000.

Flynn, Stephen Donald. Positive pressure resuscitator. 4,006,742, Cl. 128-145.800.

FMC Corporation: *See—*
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Larsen, Gregory J., 4,006,511.
Perondi, Giorgio, 4,006,704.
Vadas, Leslie, 4,006,677.

Forbes, William J., to Orange State, Inc. Refrigerant-powered engine. 4,006,595, Cl. 60-651.000.

Ford, David Alan, to Rolls-Royce (1971) Limited. Crucible for melting super-alloys. 4,006,891, Cl. 266-284.000.

Ford, Frederick L., to Pitney-Bowes, Inc. Postage meter. 4,007,359, Cl. 235-101.000.

Ford, John Learned, to Firestone Tire & Rubber Company, The. Pneumatic tires. 4,006,767, Cl. 152-357.00A.

Ford Motor Company: *See—*
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Forgiarini, Kreso. Architectural system. 4,006,566, Cl. 52-64.000.

Foster, Gene B., to Boeing Company, The. Method and apparatus for roll forming tapered structural members. 4,006,617, Cl. 72-7.000.

Foxboro Company, The: *See—*
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Frank, Michael G. Unitary liner for an aquarium. 4,006,711, Cl. 119-5.000.

Franke, Hans Georg, to Chevron Research Company. 2,4,6-Substituted-3,5-dioxo-1,2,4,6-thiatriazines. 4,007,175, Cl. 260-243.00R.

Franke, Hermann: *See—*
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Freedman, Harold H.; McGregor, Stanley D.; Yoshimine, Masao; and Kroposki, Lorraine M., to Dow Chemical Company, The. Process for preparing phosphorothioates and phenylphosphonothioates. 4,007,197, Cl. 260-294.80K.

Freeman, James W., to Jackson, Sammy Joseph, a part interest. Fruit picking device. 4,006,581, Cl. 56-333.000.

Freeman, John Paul: *See—*
Gaugh, Wilbur Seth; Heseltine, Donald Warren; Sturmer, David Michael; and Freeman, John Paul, 4,007,170.

Friberg, Jean; and Merigoux, Jean-Marie, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Supersonic centrifugal compressors. 4,006,997, Cl. 415-181.000.

Fried. Krupp Gesellschaft mit beschrankter Haftung: *See—*
Hartwig, Jurgen; Neuschutz, Dieter; and Radke, Dietrich, 4,007,034.

Friedman, Mendel; and Koenig, Nathan H., to United States of America, Agriculture. Modification of wool. 4,007,006, Cl. 8-128.00R.

Friedrich, Hans-Joachim, to J. F. Adolff AG. Artificial lawn. 4,007,307, Cl. 428-17.000.

Friedrich, Ralph E.: *See—*
Ginter, Sally P.; and Friedrich, Ralph E., 4,007,148.

Frielingsdorf, Hans: *See—*
Scholz, Norbert; Vock, Georg Friedrich; Erdmann, Kurt; John, Guenther; Frielingsdorf, Hans; Gruber, Wolfgang; and Mueller-Tamm, Heinz, 4,007,321.

Friese, Ferdinand, to Hoechst Aktiengesellschaft. Method and apparatus for the manufacture of printing plates. 4,006,984, Cl. 355-11.000.

Fritschi, Klaus-Peter: *See—*
Roll, Karl; and Fritschi, Klaus-Peter, 4,006,785.

Froberg, Magnus L., to Owens-Corning Fiberglas Corporation. Method and apparatus for making glass. 4,007,027, Cl. 65-136.000.

Froehlich, Robert J.: *See—*
Rusteberg, Robert K.; and Froehlich, Robert J., 4,007,367.

Frolkina, Zoya Mikhailovna: *See—*
Moshnin, Evgeny Nikolaevich; Nistratov, Alexei Fedorovich; Yanov, Stanislav Ivanovich; Goncharova, Raisa Ivanovna; and Frolkina, Zoya Mikhailovna, 4,006,621.

Fuchs, Otto; and Kroh, Adolf, to Hoechst Aktiengesellschaft. Naphthalimide-4,5-dicarboxylic acids. 4,007,192, Cl. 260-281.00F.

Fuji Photo Film Co., Ltd.: *See—*
Aonuma, Masashi; and Tamai, Yasuo, 4,007,072.
Miyamoto, Akio; Matsukawa, Hiroharu; and Yamamoto, Nobuo, 4,007,310.

Fujimoto, Isao; Kasubuchi, Takeshi; and Aiba, Masahiko, to Nippon Telegraph and Telephone Public Corporation; and Sharp Kabushiki Kaisha. State detection arrangement for ink jet system printer. 4,007,463, Cl. 346-75.000.

Fujimoto, Toyohisa: *See—*
Matsumoto, Zenji; Adachi, Kiyoshi; Fujimoto, Toyohisa; and Ninomiya, Nobutaka, 4,007,014.

Fujitsu Ltd.: *See—*
Hashimoto, Yoshihiro; and Kobayashi, Kengo, 4,007,410.

Fujiwara, Yasuhiko: *See—*
Murakami, Hisakazu; and Fujiwara, Yasuhiko, 4,006,934.

Fukayama, Hiroyuki: *See—*
Hashimoto, Shingo; Nishikubo, Yasuhiko; Ebihara, Heihachiro; and Fukayama, Hiroyuki, 4,006,584.

Fukuyama, Hiroshi: *See—*
Takayanagi, Toshiaki; Tsubakihara, Hiroaki; and Fukuyama, Hiroshi, 4,006,766.
Takayanagi, Toshiaki; Tsubakihara, Hiroaki; and Fukuyama, Hiroshi, 4,007,069.

Fuller, Willard A., to Hooker Chemicals & Plastics Corporation. Kraft mill recovery system. 4,007,082, Cl. 162-30.00K.

Futaguchi, Shizuo: *See—*
Nishi, Atsuyoshi; Futaguchi, Shizuo; Ishida, Akio; Ito, Toshio; Nomaguchi, Tamotsu; Makino, Toshihiko; and Saito, Tatsuo, 4,006,728.

G. D. Searle & Co.: *See—*
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G & H Technology, Inc.: *See—*
Woelfl, Rudolf G., 4,006,638.

Gachot S.A.: *See—*
Gaillard, Georges, 4,006,881.

Gadd, Ronald O. C., to USM Corporation. Automatic heel and side lasting shoe machines. 4,006,504, Cl. 12-8.300.

Gaigg, Wilhelm, to Sprecher & Schuh AG. Encapsulated switching installation. 4,007,346, Cl. 200-148.00R.

Gaillard, Georges, to Gachot S.A. Fluid-tight packing for closure devices and devices fitted with said packing. 4,006,881, Cl. 251-214.000.

Galbraith, Donald L.: *See—*
Tice, Richard P.; and Galbraith, Donald L., 4,006,554.

Galentan A.G.: *See—*
Noz, Francis X., 4,007,097.

Gamberini, Ernesto. Conveyor for conveying capsules in machines for filling said capsules with doses of pulverulent or granular product. 4,006,578, Cl. 53-282.000.

Gametrics Limited: *See—*
Ericsson, Ronald J., 4,007,087.

Gappa, Gunther; Juntgen, Harald; Klein, Jurgen; and Reichenberger, Jurgen, to Bergwerksverband GmbH. Process for the purification of waste waters with activated carbon. 4,007,116, Cl. 210-33.000.

Gapper, Terence John; Addison, George Thomas; and Tate, David Arthur, to Coal Industry (Patents) Limited. Mining machines. 4,006,935, Cl. 299-1.000.

Gardiner, Kenneth W.: *See—*
Pressman, Gerald L.; and Gardiner, Kenneth W., 4,006,983.

Gargini, Eric John, to Communications Patents Limited. Transistor switches for selecting program signals in a wired broadcasting system. 4,007,424, Cl. 325-309.000.

Garner, Howell D., to United States of America, National Aeronautics and Space Administration. Magnetic heading reference. 4,006,631, Cl. 73-178.00R.

Garner, Lloyd L., to Smith International, Inc. Diamond cutter rock bit with penetration limiting. 4,006,788, Cl. 175-330.000.

Garner, Robert; and Petitpierre, Jean Claude, to Ciba-Geigy AG. Heterocyclic substituted fluorans. 4,007,195, Cl. 260-293.580.

Garnett, John Lyndon; and Kenyon, Robert Sydney. Method of grafting monomers to wool with nitric acid. 4,007,143, Cl. 260-8.000.

Gartner, Karl-Heinz: *See—*
Rumpp, Gerhard; Gartner, Karl-Heinz; and Kruger, Wilm, 4,006,787.

Gary, Wardell: *See—*
Kimmel, Donald S.; Gary, Wardell; and Taylor, Glenn R., 4,007,401.

Gates, Gerald G.; Hasper, Charles J., Jr.; McCann, Milton H.; and Francis, Richard D., to Wheeling Closure Corporation. Container closure. 4,006,837, Cl. 215-340.000.

Gaugh, Wilbur Seth; Heseltine, Donald Warren; Sturmer, David Michael; and Freeman, John Paul, to Eastman Kodak Company. Photographic emulsions containing methine dyes having a 1H-imidazo[4,5-b]pyrazine nucleus. 4,007,170, Cl. 260-240.00E.

Gazda, Hans Otto Ernst. Apparatus for decontaminating liquids of bacteria. 4,007,007, Cl. 21-102.00R.

Gealt, Arthur E., to Honeywell Inc. Seal for process pressure to current transmitter. 4,006,640, Cl. 73-393.000.

Geer, Larry A.; and Sheffer, Ralph L., to Adams Rite Products, Inc. Locking mechanism for a slide drawer. 4,006,951, Cl. 312-320.000.

General Electric Company: *See—*
Lake, William H., 4,007,397.
Lawyer, John F.; and Terry, Vincent G., 4,007,388.
Lukes, Robert M.; and Sellins, Jeffrey C., 4,007,037.
Mango, Louis A., III; and Webb, Jimmy L., 4,007,318.
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General Mills Fun Group, Inc.: *See—*
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General Motors Corporation: *See—*
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Hewko, Lubomyr O., 4,006,643.
Witherspoon, Romeo Richard; Domanski, Edward Marion; and Davis, James Alvin, 4,007,059.

Geoffrey, David C.: *See—*
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Georg Knoblauch Werkzeugkassetten-fabrik: *See—*
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Gerigk, Gunter; and Stryk, Rudolf, to Hoechst Aktiengesellschaft. Fiber reinforced regenerated cellulose sausage casing for dry sausages. 4,006,756, Cl. 138-118.100.

Ghafghaichi, Majid: *See—*
Baker, Theodore Harris; Ghafghaichi, Majid; Stevens, Richard Charles; and Wimpfheimer, Hans, 4,007,103.

Ghanayem, Ibrahim; and Trevillyan, Alvin E., to Standard Oil Company (Indiana). Esterification reaction. 4,007,218, Cl. 260-475.00R.

Giacino, Christopher: *See—*
Evers, William J.; Heinsohn, Howard H., Jr.; Vock, Manfred Hugo; and Giacino, Christopher, 4,007,287.

Gianantonio, Anacleto: *See—*
Montorsi, Giorgio; Pellizzato, Renato; and Gianantonio, Anacleto, 4,007,220.

Gibble, Lawrence W.; and Keesey, Dennis Lee, to Caterpillar Tractor Co. Formed one-piece hollow roller shaft. 4,006,943, Cl. 308-103.000.

Gibson, Obediah Daniel; and Kazes, Daniel Philip, to International Paper Company. Wire dispenser container. 4,006,854, Cl. 229-17.00S.

Giddings & Lewis, Inc.: *See—*
Rudolph, Richard C.; Henkel, Ernest J.; Glandt, Michael A.; and Seichter, Daniel J., 4,006,518.

Gilles, Herbert L.: *See—*
Shipman, Johnson; and Gilles, Herbert L., 4,006,633.

Gillespie, Bernard M.; Ireland, Henry R.; and Stein, Thomas R., to Mobil Oil Corporation. Hydroprocessing catalyst regeneration. 4,007,131, Cl. 252-419.000.

Gillet, Bernard, to Agence Nationale de Valorisation de la Recherche (ANVAR). Plant for the heat treatment of objects by means of an electric field. 4,007,350, Cl. 219-10.810.

Ginter, Sally P.; and Friedrich, Ralph E., to Dow Chemical Company, The. Electroconductive coatings having excellent coating holdout properties. 4,007,148, Cl. 260-29.6WB.

Giordano, George P.: *See—*
England, Donald E.; Giordano, George P.; Thompson, Garland C.; and Wright, James J., 4,006,555.

Girling Limited: *See—*
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Gist-Brocades N.V.: *See—*
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Glandt, Michael A.: *See—*
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Glawion, Rudolf: *See—*
Binder, Heinrich; Glawion, Rudolf; Gruessy, Ernst; Hitz, Peter; Oetterli, Kurt; Seidl, Hans; and Stoeckli, Hans, 4,006,799.

Glaxo Laboratories Limited: *See—*
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Glenn, Joseph G. Nebulizer for use with IPPB equipment. 4,007,238, Cl. 261-78.00A.

Glenoit Mills, Inc.: *See—*
Thore, Thomas J., 4,006,610.

Glicksman, Martin; and Wankier, Bartley N., to General Foods Corporation. Low calorie sweetening composition and method for making same. 4,007,288, Cl. 426-548.000.

Glory Kogyo Kabushiki Kaisha: *See—*
Iguchi, Masayuki; and Kosaka, Toshihisa, 4,007,358.

Godsay, Madhu P.: *See—*
Ring, Michael; Godsay, Madhu P.; Swenson, Roy S.; and Kent, Joseph N., 4,007,083.

Golias, Tipton L.; and Mayes, David, to Helena Laboratories Corporation. Limited pressure applicator. 4,006,705, Cl. 118-221.000.

Golovanenko, Sergei Alexandrovich: *See—*
Levin, Felix Lvovich; Golovanenko, Sergei Alexandrovich; and Dmitriev, Vladimir Alexandrovich, 4,007,073.

Gombar, Oscar J.; and Howard, James, to Cities Service Company. Composition and preparation of a dry predispersed coated pigment. 4,007,051, Cl. 106-308.00Q.

Gomes, Gilbert S.: *See—*
Kakar, Sarwan K.; Kappler, Frank R.; Gomes, Gilbert S.; and Cramer, John J., 4,007,305.

Goncharova, Raisa Ivanovna: *See—*
Moshnin, Evgeny Nikolaevich; Nistratov, Alexei Fedorovich; Yanov, Stanislav Ivanovich; Goncharova, Raisa Ivanovna; and Frolkina, Zoya Mikhailovna, 4,006,621.

Goodman, Dennis George, to Lucas Electrical Company Limited, The. Assembly of a recessed heat sink and a semiconductor device sealed within the recess in the heat sink and thermally connected to the heat sink. 4,007,477, Cl. 357-81.000.

Goossen, Louis. Trainer and crowd gate. 4,006,714, Cl. 119-20.000.

Gordesky, Stanley E.: *See—*
Cohen, Arthur I.; Sim, James S. Y.; Van Horn, Maurice H.; Gordesky, Stanley E.; and Gordon, Stanley I., 4,007,258.

Gordon, Stanley I.: *See—*
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Gorecki, Henryk: *See—*
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Goryaev, Mikhail Ivanovich; Ulyanova, Antonina Demidovna; Maier, Reingold Georgievich; and Startsev, Vadim Nikolaevich. Process for manufacturing a fatty concentrate. 4,007,284, Cl. 426-98.000.

Gosden, John, to Reed International Limited. Supporting arrangements for porous diffusers. 4,007,240, Cl. 261-122.000.

Goto, Naohiro: *See—*
Nonaka, Yasuhiko; Goto, Naohiro; and Shidara, Keiichi, 4,007,395.
Nonaka, Yasuhiko; Hirai, Tadaaki; Goto, Naohiro; and Shidara, Keiichi, 4,007,473.

Gottfried Bischoff Bau Kompl.: *See—*
Hegemann, Karl-Rudolf, 4,007,025.

Gottschol, Hans-Joachim; and Gottschol, Karl-Josef, to Dr. Ing. Gottschol Metallurgie Kommanditgesellschaft. Method of smelting aluminum. 4,007,036, Cl. 75-68.00R.

Gottschol, Karl-Josef: *See—*
Gottschol, Hans-Joachim; and Gottschol, Karl-Josef, 4,007,036.

Gould Inc.: *See—*
Owens, Boone B.; and Hanson, Hilton J., 4,007,122.
Rao, Purushotham; and Mao, George W., 4,007,056.
Sorensen, Dennis Dean; Erickson, Richard Allan; and Iepson, Harry Ellwood, 4,007,060.

Grace Engineering, Inc.: *See—*
Grace, Louis, Jr.; and Grace, Richard L., 4,006,681.

Grace, Louis, Jr.; and Grace, Richard L. Type carrier belt for a printer. 4,006,680, Cl. 101-93.140.

Grace, Louis, Jr.; and Grace, Richard L., to Grace Engineering, Inc. Endless type flexible support belt for a high speed printer. 4,006,681, Cl. 101-111.000.

Grace, Richard L.: *See—*
Grace, Louis, Jr.; and Grace, Richard L., 4,006,680.
Grace, Louis, Jr.; and Grace, Richard L., 4,006,681.

Graffman, Johan Holger, to Clean Air Company, Inc. Compressed oil burner starting mechanism. 4,007,000, Cl. 431-1.000.

Granholm, Sven, to Linden-Alimak AB. Hydraulic operated rock drilling apparatus. 4,006,783, Cl. 173-12.000.

Grant, Peter M.: *See—*
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Granzer, Ernold: *See—*
Mauz, Otto; and Granzer, Ernold, 4,007,282.

Gray, James H., to Cyprus Specialty Steel. Method and apparatus for scrubbing the ends and sides of a motor vehicle. 4,007,053, Cl. 134-6.000.

Gray, Robert C.: *See—*
Shively, Lawrence A.; Gray, Robert C.; and Hoy, Robert P., 4,006,862.

Greaf, Clarence; and Price, William R., to Magnavox Company, The. Video game target reset apparatus. 4,006,898, Cl. 273-85.00R.

Greaves, Geoffrey Stuart; and Bunce, Roger Abraham, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Social Services in Her Britannic Majesty's Government of the. Specimen treatment apparatus. 4,007,011, Cl. 23-259.000.

Greene, Joel C.: *See—*
Redmon, Jackson T.; Haidle, Irvin; Herzog, Donald; and Greene, Joel C., 4,006,715.

Greenfield, Charles; Casparian, Robert E.; and Bonanno, Anthony J., to Hanover Research Corporation. Process and apparatus for recovering clean water from aqueous wastes. 4,007,094, Cl. 202-174.000.

Greenwald, Robert J. Fecal examination device. 4,007,012, Cl. 23-259.000.

Griggs, Kent M.: *See—*
Sergeant, Winston O.; Levy, John V.; Lignos, Demetrios; and Griggs, Kent M., 4,007,448.

Grise, Frederick Gerard Joseph: *See—*
Lovell, Walter Carl; and Grise, Frederick Gerard Joseph, 4,006,700.

Groh, Andrew F., to FMC Corporation. Compact dust filter system. 4,007,026, Cl. 55-302.000.

Gros, Georges: *See—*
Berger, Christian; Farge, Daniel; Gros, Georges; Messer, Mayer Naoum; and Moutonnier, Claude, 4,007,176.

Groves, Donald W., to Ford Motor Company. Device for reducing wind resistance of a vehicle. 4,006,931, Cl. 296-1.00S.

Gruber, Jeffrey S., to Raymond Lee Organization, Inc., The, a part interest. Card game. 4,006,906, Cl. 273-152.00R.

Gruber, Wolfgang: *See—*
Scholz, Norbert; Vock, Georg Friedrich; Erdmann, Kurt; John, Guenther; Frielingsdorf, Hans; Gruber, Wolfgang; and Mueller-Tamm, Heinz, 4,007,321.

Gruessy, Ernst: *See—*
Binder, Heinrich; Glawion, Rudolf; Gruessy, Ernst; Hitz, Peter; Oetterli, Kurt; Seidl, Hans; and Stoeckli, Hans, 4,006,799.

Gruner, Hans. Drill for use in a boring machine. 4,006,995, Cl. 408-157.000.

Gruner & Jajr AG & Co.: *See—*
Sindermann, Wolfgang, 4,007,362.

Gruppo Lepetit S.p.A.: *See—*
Montorsi, Giorgio; Pellizzato, Renato; and Gianantonio, Anacleto, 4,007,220.
Sale, Amedeo Omodei; Consonni, Pietro; and Lerner, Leonard J., 4,007,276.

GSE, Inc.: *See—*
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GTE Automatic Electric Laboratories Incorporated: *See—*
Johnson, Melvin L., 4,006,955.
Langsdorf, Lloyd L.; Kusan, Lawrence J.; and Srivastava, Dinesh K., 4,007,337.
Marheine, Edward A., 4,007,333.
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GTE Sylvania Incorporated: *See—*
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Gubin, Jean: *See—*
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Guerpillon, Henri: *See—*
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Guild, Charles L. Tapered pile tips. 4,006,600, Cl. 61-53.000.

Guitard, Arthur Herbert: *See—*
Chan, Lock-Lim; and Guitard, Arthur Herbert, 4,007,084.

Gulf & Western Manufacturing Company (Systems): *See—*
Solomon, Elias F., 4,007,374.

Gulyaeva, Galina Petrovna: *See—*
Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Lepnidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 4,007,317.

Gunther, W. H. H.: *See—*
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Gunther, Wolfgang H. H.: *See—*
Chu, Joseph Y. C.; and Gunther, Wolfgang H. H., 4,007,101.

Gurgiolo, Arthur E., to Dow Chemical Company, The. High resiliency, flexible polyurethane foams and crosslinkers for the preparation thereof. 4,007,139, Cl. 260-2.5AQ.

Gurkaynak, Erdal; Spatz, Jurgen; Vogelsberg, Dieter; and Liedtke, Gerhard, to Siemens Aktiengesellschaft. Method and apparatus for reducing the electrical coupling in communicating cables. 4,006,582, Cl. 57-34.0AT.

Guthrie, Robert William; and Kierstead, Richard Wightman, to Hoffmann-La Roche Inc. Hydroxycitric acid derivatives. 4,007,208, Cl. 260-343.600.

Gutman, Arnold D.: *See—*
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Gwilliam, James L., Jr.: *See—*
Neddo, Keith S.; Alder, G. Michael; and Gwilliam, James L., Jr., 4,006,558.

Gyllinder, Lars Anders Gustaf, to Svenska Luftkompressor AB. Method of and device for drying compressed gases, especially compressed air for brake systems in motor vehicles. 4,007,021, Cl. 55-33.000.

Haag, Charles Walter; and Pearson, Samuel Joseph, to Whirlpool Corporation. Liner and insulation structure for refrigeration apparatus. 4,006,947, Cl. 312-214.000.

Haber, Terry M. Simplified actuating switch for electronic timepieces. 4,007,347, Cl. 200-159.00R.

Habermeier, Jurgen; Batzer, Hans; and Porret, Daniel, to Ciba-Geigy Corporation. Polyglycidyl compounds containing N-heterocyclic structure. 4,007,199, Cl. 260-309.500.

Habu, Teiji; Koremotsu, Shinobu; Wada, Tsuneo; Sasaki, Takashi; and Matsumoto, Masayuki, to Konishiroku Photo Industry Co., Ltd. Method for hardening gelatin. 4,007,163, Cl. 260-117.000.

Hagelbarger, David William, to Bell Telephone Laboratories, Incorporated. Multitone pushbutton dial phase shift scanning circuitry. 4,007,459, Cl. 340-365.00S.

Hagenuk vormals Neufeld & Kuhnke GmbH: *See—*
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Haibt, Luther Harold; and Mullery, Alvin Paul, to International Business Machines Corporation. Data sharing computer network. 4,007,450, Cl. 340-172.500.

Haidle, Irvin: *See—*
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Halek, Jan; and Jezdinsky, Jaroslav, to Rektorat University Palackeho v Olomouci. Device for measuring a nociceptive reaction of laboratory animals. 4,007,420, Cl. 324-181.000.

Hall, John B.: *See—*
Sanders, James Milton; Schreiber, William L.; and Hall, John B., 4,007,137.

Hallman, Ellis A., to Kansas Jack, Inc. Gauge for measuring vehicle frame alignment. 4,006,532, Cl. 33-288.000.

Halterman, Francis J., Jr., to General Motors Corporation. Roller frame for crawler tractor. 4,006,940, Cl. 305-12.000.

Hamaguchi, Hachiro: *See—*
Yasuda, Toshitaka; Takahama, Hiroshi; Hamaguchi, Hachiro; Shimizu, Sajiro; and Mori, Kenji, 4,007,063.

Hamido B.V.: *See—*
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Hamilton, Ramon D., to Upjohn Company, The. Interferon induction. 4,007,086, Cl. 195-1.800.

Hammann, Ingeborg: *See—*
Maurer, Fritz; Riebel, Hans-Jochem; Rohe, Lothar; Hammann, Ingeborg; and Homeyer, Bernhard, 4,007,269.

Hancock, Seth E. Angle dressing tool. 4,006,727, Cl. 125-11.0AT.

Handren, Ralph M.; and McKay, John P., to Arnold Engineering Company. Hysteresis alloy. 4,007,065, Cl. 148-31.570.

Hanfling, Jerome D.; and Mengoli, Karl L., to United States of America, Army. Phased array element retention. 4,007,460, Cl. 343-776.000.

Hanmura, Hisao: *See—*
Kawano, Shigeyoshi; Hanmura, Hisao; and Sunada, Masayoshi, 4,006,790.

Hanna, Harry A. Personal electrostatic safety monitor with induction plate sensing means. 4,007,418, Cl. 324-72.000.

Hannen, Willi: *See—*
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Hanover Research Corporation: *See—*
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Hanson, Hilton J.: *See—*
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Harada, Setsuo: *See—*
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Harker, Royce K.: *See—*
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Harlan, James T., Jr., to Shell Oil Company. Polyacrylate-grafted block copolymer adhesive compositions. 4,007,311, Cl. 428-246.000.

Harmer, Dolores A.: *See—*
McMahon, Robert J.; and Harmer, Dolores A., 4,006,588.

Harrow, Charles Lawrence; Bonnace, Jean Claude; and Wilkens, Gunter Gerd, to CGR Medical Corporation. Phase control system for polarized synchronous motors. 4,006,977, Cl. 352-133.000.

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Kahan, William; Rogers, Howard D.; and Rupinski, Fredrick A., to Singer Company, The. Positioning control for programmable knitting machines. 4,006,611, Cl. 66-75.200.

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Kalopissis, Gregoire; and Bugaut, Andree, to L'Oreal. Substituted-2-nitro-paraphenylenediamines and processes for producing same. 4,007,228, Cl. 260-573.000.

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Weisser, Eugene P.; Osan, G. Alan; and Mailki, Edward P., 4,007,319.
Majestic Lock Co., Inc.: *See—*
Zion, Westley, 4,006,613.
Makino, Takayuki; Nagai, Masahiko; Yamanaka, Teruo; and Hori, Osamu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Internal combustion engine distributor having oxidized electrodes or terminals. 4,007,342, Cl. 200-19.00R.
Makino, Toshihiko: *See—*
Nishi, Atsuyoshi; Futaguchi, Shizuo; Ishida, Akio; Ito, Toshio; Nomaguchi, Tamotsu; Makino, Toshihiko; and Saito, Tatsuo, 4,006,728.
Maldonado, Bernardo: *See—*
Patino, Armando; and Maldonado, Bernardo, 4,007,259.
Malinin, Anatoly Isidorovich: *See—*
Vainer, Shimon Abramovich; Temerev, Anatoly Fedorovich; Vainer, Savely Abramovich; Nikulin, Sergei Sergeevich; Kheifets, Matvei Evseevich; Usoltsev, Vadim Anatolievich; Matveev, Evgeny Fedorovich; Kazakov, Georgy Petrovich; Salkov, Vladimir Alexandrovich; and Malinin, Anatoly Isidorovich, 4,006,890.
Mallory, Edwin E., to National-Standard Company. Tire building apparatus. 4,007,081, Cl. 156-417.000.
Malm Fireplaces, Inc.: *See—*
Crownover, Glen D., 4,006,733.
Malofsky, Bernard Miles, to Loctite Corporation. Initiator for anaerobic compositions. 4,007,323, Cl. 526-312.000.
Mangaraj, Duryodhan: *See—*
Horowitz, Carl; Dichter, Michael; Abrams, Nathan; and Mangaraj, Duryodhan, 4,006,749.
Mango, Louis A., III; and Webb, Jimmy L., to General Electric Company. Phosphorylated polystyrene and method for forming same. 4,007,318, Cl. 526-21.000.
Mann, Arnold: *See—*
Feldmann, Joachim; Mann, Arnold; and Heimbach, Ludolf, 4,006,791.
Mann, Egon; and Fischer, Manfred, to Zahnradfabrik Friedrichshafen AG. Swing mounting for cement mixer and the like. 4,006,946, Cl. 308-194.000.
Mannesmannrohren-Werke AG: *See—*
Wassen, Johann; Kron, Heinz; and Pferdekamper, Hans, 4,006,622.
Manning, Edward T., Jr.: *See—*
Kacir, Ivan R.; Manning, Edward T., Jr.; and Schmieley, Donald A., 4,006,691.
Mao, George W.: *See—*
Rao, Purushothama; and Mao, George W., 4,007,056.
Marbury, Thomas Kingston. Solitaire game lap board. 4,006,905, Cl. 273-148.00A.
Marconi Company Limited, The: *See—*
Wisbey, Philip Henry; and Kimber, Paul Kevin, 4,007,396.
Margotte, Dieter: *See—*
Adelmann, Siegfried; Margotte, Dieter; Vernaleken, Hugo; Niederprum, Hans; Meussdoerffer, Johann Nikolaus; and Nouvertne, Werner, 4,007,150.
Marheine, Edward A., to GTE Automatic Electric Laboratories Incorporated. Automatic call transmitter of the dual tone multifrequency type. 4,007,333, Cl. 179-6.00D.
Marincic, Nikola; Merz, Ronald; and Kelsey, Robert H., to P. R. Mallory & Co., Inc. Electric cell with zinc coil anode and method of making it. 4,007,054, Cl. 429-206.000.
Mark, Victor, to General Electric Company. Flame retardant polycarbonate composition. 4,007,155, Cl. 260-45.70S.
Marker, Peter O., to Land Tool Company. Safety helmet. 4,006,496, Cl. 2-414.000.
Marsili, Leonardo; Rossetti, Vittorio; and Pasqualucci, Carmine, to Archifar Industrie Chimiche del Trentino S.p.A. Method of preparing derivatives of rifamycin S. 4,007,169, Cl. 260-239.30P.
Martin, Anthony Newman, to United Technologies Corporation. Adaptive control system using position feedback. 4,007,361, Cl. 235-150.100.
Martin, John Henry Edward James; Tresner, Homer David; and Porter, John Norman, to American Cyanamid Company. Antibiotic BM123 and production thereof. 4,007,167, Cl. 536-17.000.
Martin, Patrick H.: *See—*
Dunn, James L., Jr.; Ward, John K.; and Martin, Patrick H., 4,007,304.
Martinez, Antonio Martinez. Apparatus and method of watering objects. 4,006,843, Cl. 222-68.000.
Martino, Lawrence A.: *See—*
Avery, Michael J.; Martino, Lawrence A.; and Yonko, Jon D., 4,007,244.
Maruzen Sewing Machine Co., Ltd.: *See—*
Matsuda, Kimikazu, 4,006,699.
Masonite Corporation: *See—*
Clarke, John T.; Harker, Royce K.; Hittmeier, Michael E.; and Eaton, James W., 4,007,076.
Mast, John George, Jr., to Procter & Gamble Company, The. Apparatus for forming tampons and assembling same in inserters. 4,006,515, Cl. 19-144.500.
Mathews, William. Display device. 4,006,545, Cl. 40-36.000.
Mathias Bauerle GmbH, Firma: *See—*
Raible, Hermann; Dorer, Wilfried; and Lehmann, Werner, 4,006,894.
Matsuda, Kimikazu, to Maruzen Sewing Machine Co., Ltd. Thread guide means for sewing machine. 4,006,699, Cl. 112-241.000.
Matsuda, Kokichi: *See—*
Aoki, Seiji; Kamiyana, Akira; and Matsuda, Kokichi, 4,007,078.
Matsui, Katsuaki: *See—*
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Toda, Toshimasa; Mori, Eiko; Horiuchi, Hideo; Higashida, Susumu; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohta, Noriyuki; and Osawa, Hisayou, 4,007,158.
Matsukawa, Hiroharu: *See—*
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Matsumoto, Masayuki: *See—*
Habu, Teiji; Koremotsu, Shinobu; Wada, Tsuneo; Sasaki, Takashi; and Matsumoto, Masayuki, 4,007,163.
Matsumoto, Zenji; Adachi, Kiyoshi; Fujimoto, Toyohisa; and Ninomiya, Nobutaka, to Takeda Chemical Industries, Ltd. Activated carbon revivification equipment. 4,007,014, Cl. 23-277.00R.
Matsuoka, Nozomu: *See—*
Ojima, Shin; Ohgami, Kazuhiko; Watanabe, Kazutaka; Yoshimura, Tohru; Katou, Masaya; and Matsuoka, Nozomu, 4,007,364.
Matsushita Electric Industrial Co., Ltd.: *See—*
Ishida, Eisuke; Takashima, Yuji; Nishiguchi, Hisanori; and Oda, Fujio, 4,007,045.
Yamamoto, Kozo; and Ibi, Takuro, 4,006,764.
Matsushita Seiko Co., Ltd.: *See—*
Matsuyoshi, Masaya; and Hirano, Isao, 4,006,672.
Matsuyoshi, Masaya; and Hirano, Isao, to Matsushita Seiko Co., Ltd. Ventilation fan (ventilation system). 4,006,672, Cl. 98-39.000.
Mattig, Peter: *See—*
Ballarin, Jurgen; and Mattig, Peter, 4,006,601.
Matveev, Evgeny Fedorovich: *See—*
Vainer, Shimon Abramovich; Temerev, Anatoly Fedorovich; Vainer, Savely Abramovich; Nikulin, Sergei Sergeevich; Kheifets, Matvei Evseevich; Usoltsev, Vadim Anatolievich; Matveev, Evgeny Fedorovich; Kazakov, Georgy Petrovich; Salkov, Vladimir Alexandrovich; and Malinin, Anatoly Isidorovich, 4,006,890.
Mauquoy, Jean-Baptiste. Method of producing a pre-stressed beam of steel and concrete. 4,006,523, Cl. 29-452.000.
Maurer, Fritz; Riebel, Hans-Jochem; Rohe, Lothar; Hammann, Ingeborg; and Homeyer, Bernhard, to Bayer Aktiengesellschaft. O-Ethyl-O-n-propyl-O-[1-(substituted-phenyl)-2-cyano-vinyl]-thionophosphoric acid esters. 4,007,269, Cl. 424-210.000.
Maurer, Martin, to Hydrel A.G. Device for protecting tools and workpieces from damage on a hydraulically or pneumatically operated stamping press. 4,006,655, Cl. 83-63.000.
Mauz, Otto; and Granzer, Ernold, to Hoechst Aktiengesellschaft. Lowering lipid and sugar levels in the blood with a bis(4-hydroxyphenyl)alkanoic acid or ester thereof. 4,007,282, Cl. 424-308.000.
Max Kammerer GmbH: *See—*
Meyer, Ernst; and Burghoff, Karl, 4,006,673.
Mayes, David: *See—*
Golias, Tipton L.; and Mayes, David, 4,006,705.
Mazaki, Shiro: *See—*
Ishizuka, Takashi; Mazaki, Shiro; Miwa, Naoki; and Maesoba, Masatosi, 4,007,146.
McBride, Lyle E., Jr.: *See—*
Jost, Ernest M.; McBride, Lyle E., Jr.; and Santala, Teuvo J., 4,007,404.
McCall, Richard J. Mailing carton. 4,006,822, Cl. 206-424.000.
McCann, Floyd E.: *See—*
Auxer, Marvin L.; McCann, Floyd E.; and Shepherd, Gerald D., 4,006,832.
McCann, Milton H.: *See—*
Gates, Gerald G.; Hasper, Charles J., Jr.; McCann, Milton H.; and Francis, Richard D., 4,006,837.
McClain, Herbert D.; Parikh, Bipin D.; and Burkey, John K., to NCR Corporation. Data communications system with improved asynchronous retiming circuit. 4,007,329, Cl. 178-69.100.
McClain, Stephen A.; Doman, Harvey A.; and Entus, Richard D., to Cascade Pole Company. Method of making a fiberglass pole. 4,007,075, Cl. 156-62.200.
McDanald, Charles W.: *See—*
Slater, Dan; Dryer, Ivan M.; and McDanald, Charles W., 4,006,970.

McDonald, Alan T., to United States of America, Transportation. Inflatable drag reducer for land vehicles. 4,006,932, Cl. 296-1.00S.

McDonald, Henry Stanton, to Bell Telephone Laboratories, Incorporated. Time division digital local telephone office with telemetering line unit. 4,007,334, Cl. 179-15.0AT.

McDonnell Douglas Corporation: *See—*
Sheratte, Martin B., 4,007,123.

McDowell-Wellman Engineering Company: *See—*
Kacir, Ivan R.; Manning, Edward T., Jr.; and Schmieley, Donald A., 4,006,691.

McFearin, Thurman Chestler, Jr., to El Paso Products Company. 2-Methoxy-4-methyl-3-oxo-cyclopent-1-ene-1,4-dicarboxylic acid esters. 4,007,216, Cl. 260-468.00K.

McGee, James Monroe, to Boeing Company, The. Tube clamp. 4,006,874, Cl. 248-74.00R.

McGrath, James L.: *See—*
Dawson, Robert H.; and McGrath, James L., 4,006,878.

McGregor, Stanley D.: *See—*
Freedman, Harold H.; McGregor, Stanley D.; Yoshimine, Masao; and Kroposki, Lorraine M., 4,007,197.

McKay, John P.: *See—*
Handren, Ralph M.; and McKay, John P., 4,007,065.

McLachlan, Corran Norman Stuart: *See—*
Smith, Donald Kenneth; and McLachlan, Corran Norman Stuart, 4,007,117.

McLain, Bruce H.: *See—*
Sallee, John P.; Speight, Bill W.; and McLain, Bruce H., 4,007,024.

McLaughlin, Donald W., to GTE Automatic Electric Laboratories Incorporated. Switching and transmission technique using a method and arrangement of channel allocation for providing conferencing. 4,007,338, Cl. 179-18.0BC.

McLaughlin, Timothy C.: *See—*
Perlich, Frank J.; Perlich, Frank J., Jr.; Perlich, Jon R.; and McLaughlin, Timothy C., 4,006,912.

McMahon, Garfield W., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defense. Self-deploying instrument assembly. 4,007,436, Cl. 340-8.00S.

McMahon, Robert J.; and Harmer, Dolores A. Wrist watch. 4,006,588, Cl. 58-126.00R.

McQueary, Agnes R., to Procter & Gamble Company, The. Method of conditioning fabrics in a clothes dryer. 4,007,300, Cl. 427-242.000.

Mechaneer, Inc.: *See—*
Shively, Lawrence A.; Gray, Robert C.; and Hoy, Robert P., 4,006,862.

Medrad, Inc.: *See—*
Kranys, Rudolph J.; Heilman, Marlin S.; Zdrojkowski, Ronald J.; and Swann, George R., 4,006,736.

Meier, Jean: *See—*
Farthouat, Anne; and Meier, Jean, 4,007,275.

Meiners, Elmo R., to M & W Gear Company. Concurrent-countercurrent flow grain dryer with air recycling means. 4,006,536, Cl. 34-169.000.

Meinhold, James F.: *See—*
Siedlecki, Dennis Ted; and Meinhold, James F., 4,007,291.

Melzer, Roland, to R. Melzer oHG Machinenbau u. Metallverarbeitung. Printing machine. 4,006,684, Cl. 101-212.000.

Mengoli, Karl L.: *See—*
Hanfling, Jerome D.; and Mengoli, Karl L., 4,007,460.

Merck & Co., Inc.: *See—*
Chaiet, Louis; Hernandez, Sebastian; and Zimmerman, Sheldon B., 4,007,090.
Shen, Tsung-Ying; Jensen, Norman P.; and Wagner, Arthur F., 4,007,190.

Merigoux, Jean-Marie: *See—*
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Merit Plastics, Inc.: *See—*
Bartholomew, Donald D., 4,006,922.

Merz, Ronald: *See—*
Marincic, Nikola; Merz, Ronald; and Kelsey, Robert H., 4,007,054.

Merzenich, Konrad, to Klockner-Humboldt-Deutz Aktiengesellschaft. Separator worm feed auger and wear plates. 4,006,855, Cl. 233-7.000.

Messacar, Howard E. Artificial baits. 4,006,551, Cl. 43-42.040.

Messer, Mayer Naoum: *See—*
Berger, Christian; Farge, Daniel; Gros, Georges; Messer, Mayer Naoum; and Moutonnier, Claude, 4,007,176.

Messerschmitt-Bolkow-Blohm GmbH: *See—*
Kranz, Walter; and Tillmann, Heinz, 4,006,755.

Metallgesellschaft Aktiengesellschaft: *See—*
Batza, Willi; Baier, Gunter; and Schmidt, Hermann, 4,007,023.

Metallschlauch-Fabrik Pforzheim (vorm. Hch. Witzenmann) Gesellschaft mit beschrankter Haftung: *See—*
Berger, Peter, 4,006,873.

Metrailer, William J.; and Weissman, Walter, to Exxon Research and Engineering Company. Process for producing low sulfur coke. 4,007,092, Cl. 201-17.000.

Metschnabl, Andreas; and Burkhardt, Gottfried, to D I E H L datensysteme GmbH. Reversing device for the longitudinal advance of a ribbon of type printers. 4,006,811, Cl. 197-161.000.

Meussdoerffer, Johann Nikolaus: *See—*
Adelmann, Siegfried; Margotte, Dieter; Vernaleken, Hugo; Niederprum, Hans; Meussdoerffer, Johann Nikolaus; and Nouvertne, Werner, 4,007,150.

Meyer, Ernst; and Burghoff, Karl, to Max Kammerer GmbH. Adjustable air outlet nozzle for automobile heating and venting systems. 4,006,673, Cl. 98-40.00A.

Meyers, Marion Douglas; and Landi, Henry Patrick, to American Cyanamid Company. Process for preparation of an electrode structure containing WO_3 use of the structure in an electrochromic cell. 4,006,966, Cl. 350-160.00R.

Micallef, Lewis A., to Leeds and Micallef. Safety cap. 4,006,836, Cl. 215-218.000.

Michelon, Francois: *See—*
Sourgens, Jacques; Lajotte, Dominique; and Michelon, Francois, 4,007,341.

Mikhailets, Georgy Avxentievich: *See—*
Kulbakh, Valter Osvaldovich; Kokushina, Tatyana Mikhailovna; Lagert, Irina Kondratievna; Mikhailets, Georgy Avxentievich; Kholodova, Galina Vasilievna; Ekzemplyarov, Oleg Nikolaevich; Zelmanov, Ruvim Bentsionovich; Sokolov, Leonid Borisovich; Etingov, Evgeny Davidovich; and Lushitskaya, Irina Mikhailovna, 4,007,166.

Mikolics, Sandor; Ziegler, Karoly; and Homola, Viktor, to Novex Talalmanyfejleszto es Ertekesito Kulkereskedelmi Rt. Cooling-water supply system with self-adjusting hydraulics. 4,006,596, Cl. 60-690.000.

Mikulski, Walter Edward, to United Technologies Corporation. Die casting apparatus which eliminates shot sleeve-metal contact. 4,006,774, Cl. 164-312.000.

Miles, Marshall, to Vapor Corporation. Air conditioning system for a railway vehicle. 4,006,603, Cl. 62-229.000.

Miller Printing Machinery Co.: *See—*
Mosemiller, Robert L., 4,006,685.

Miller, Richard Lee. Tactile learning device. 4,006,541, Cl. 35-35.00H.

Millheiser, Melvin: *See—*
Wurzel, Hugo; and Millheiser, Melvin, 4,006,659.

Millmaster Onyx Corporation: *See—*
Sorrentino, Ralph P.; and Like, Burton M., 4,007,261.

Minami, Tieko, to Kawamura, Yoichi. Practice golf ball. 4,006,908, Cl. 273-183.00C.

Mincer, Joseph L.; and Pochan, John M., to Xerox Corporation. Mechanically viable developer materials. 4,007,293, Cl. 427-19.000.

Mink, Bernardus H.: *See—*
Naber, Jaap E.; and Mink, Bernardus H., 4,007,129.

Minnesota Mining and Manufacturing Company: *See—*
Nelson, Alfred Dwayne; and Espelien, Larry E., 4,007,058.

Mishima Kosan Co., Ltd.: *See—*
Takeuchi, Shinjiro; Ichioka, Satoshi; Shirosaka, Masaki; and Inoue, Tadashi, 4,007,417.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Nishi, Atsuyoshi; Futaguchi, Shizuo; Ishida, Akio; Ito, Toshio; Nomaguchi, Tamotsu; Makino, Toshihiko; and Saito, Tatsuo, 4,006,728.

Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Uotani, Hiroshi; Kubo, Masayoshi; and Irie, Nobuhiko, 4,007,068.

Miwa, Naoki: *See—*
Ishizuka, Takashi; Mazaki, Shiro; Miwa, Naoki; and Maesoba, Masatosi, 4,007,146.

Miyahara, Shigeru: *See—*
Inaba, Masao; Sugimoto, Atsumi; Shimizu, Mikio; Onosato, Masashi; Miyahara, Shigeru; and Kashigi, Kazuo, 4,007,486.

Miyakawa, Seiichi; and Okamoto, Toyoo, to Ricoh Co., Ltd. Developing unit for electrophotography. 4,006,709, Cl. 118-648.000.

Miyakawa, Seinan, to Asahi Kogaku Kogyo Kabushiki Kaisha. Electrical system having a photoelectric converter to be used in photography. 4,007,466, Cl. 354-24.000.

Miyamae, Toshiaki. Motorized fishing reel with clutches. 4,006,867, Cl. 242-217.000.

Miyamoto, Akio; Matsukawa, Hiroharu; and Yamamoto, Nobuo, to Fuji Photo Film Co., Ltd. Method of desensitization using desensitizing composition. 4,007,310, Cl. 428-195.000.

Mizunuma, Susumu: *See—*
Yanagimoto, Samon; Kawaharada, Minoru; Yoshiwara, Seishiro; Mizunuma, Susumu; and Sugiyama, Motoaki, 4,006,618.

Mobil Oil Corporation: *See—*
Butter, Stephen Allan, 4,007,231.
Gillespie, Bernard M.; Ireland, Henry R.; and Stein, Thomas R., 4,007,131.
Smadja, Rene; and Houizot, Louis, 4,007,127.

Mohr, Harvey O., to HydroTech International, Inc. Pipe coupling. 4,006,921, Cl. 285-18.000.

Mohsen, Amr Mohamed, to Bell Telephone Laboratories, Incorporated. Balanced regenerative charge detection circuit for semiconductor charge transfer devices. 4,007,381, Cl. 307-235.00F.

Mollerstedt, Karl Allan Bonde, to IFO AB. Apparatuses for distributing flushing liquid in closet pans. 4,006,497, Cl. 4-1.000.

Monarch Mirror Door Co., Inc.: *See—*
Kain, Oscar, 4,006,569.

Monsanto Company: *See—*
Avery, Michael J.; Martino, Lawrence A.; and Yonko, Jon D., 4,007,244.
Kim, Keun Y., 4,007,260.
Leach, Harry S.; Singleton, Thomas C.; and Wei, Yu Wen, 4,007,130.

Montorsi, Giorgio; Pellizzato, Renato; and Gianantonio, Anacleto, to Gruppo Lepetit S.p.A. Preparation of phthalaldehydic acid from $\alpha,\alpha,\alpha,\alpha',\alpha'$-pentachloro-o-xylene. 4,007,220, Cl. 260-515.00R.

Moore, William C.; Connors, John D.; and Newman, Richard W., to Welch Allyn, Inc. Otoscope construction. 4,006,738, Cl. 128-9.000.

Moreno, Roland, to Societe anonyme dite: Societe Internationale pour l'Innovation. Data-transfer system. 4,007,355, Cl. 235-61.70R.

Morgan Construction Company: *See*—
Hill, William J., 4,006,828.
Mori, Eiko: *See*—
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Toda, Toshimasa; Mori, Eiko; Horiuchi, Hideo; Higashida, Susumu; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohta, Noriyuki; and Osawa, Hisayou, 4,007,158.
Mori, Kenji: *See*—
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Morimura, Syoji: *See*—
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Toda, Toshimasa; Mori, Eiko; Horiuchi, Hideo; Higashida, Susumu; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohta, Noriyuki; and Osawa, Hisayou, 4,007,158.
Morishita, Masanobu; Inoue, Hidehiko; and Kawasaki, Mitsuru, to Nippon Electric Co., Ltd. Solid-state color imaging apparatus having charge-coupled devices. 4,007,488, Cl. 358-29.000.
Moritomo, Sadao; Kikuchi, Shinichi; and Ando, Shigenori, to Seiko Seiki Kabushiki Kaisha. Spindle assembly having an electrode spindle. 4,006,953, Cl. 339-6.00R.
Morley, Richard E.: *See*—
Bromberg, Michael Arnold; Fletcher, William E.; Morley, Richard E.; and Schwenk, George G., 4,007,443.
Morris, Earl L., to Acorn Engineering Company. Security frame and mirror assembly. 4,006,572, Cl. 52-506.000.
Morroni, Peter J. Degating. 4,006,879, Cl. 249-68.000.
Morrow, John Edward: *See*—
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Morse, John B.: *See*—
Land, Edwin H.; and Morse, John B., 4,007,471.
Mosca, Virgilio, to Societa Italiana Telecomunicazioni Siemens S.p.A. Videotelephone system with anti-crosstalk means. 4,007,328, Cl. 358-85.000.
Mosemiller, Robert L., to Miller Printing Machinery Co. Axial and circumferential register control apparatus for a cylinder in a press frame. 4,006,685, Cl. 101-248.000.
Moshnin, Evgeny Nikolaevich; Nistratov, Alexei Fedorovich; Yanov, Stanislav Ivanovich; Goncharova, Raisa Ivanovna; and Frolkina, Zoya Mikhailovna. Pipe bending machine. 4,006,621, Cl. 72-151.000.
Mosler Safe Company, The: *See*—
Hochradel, Ernest; Hauer, Werner; and Vogel, Victor J., 4,006,868.
Motorola, Inc.: *See*—
Bara, Edwin Stanley, 4,006,853.
Dattilo, Donald J., 4,006,522.
Moutonnier, Claude: *See*—
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Mravic, Brian: *See*—
Shapiro, Stanley; Shapiro, Eugene; Mravic, Brian; and Watson, W. Gary, 4,007,039.
Mueller-Tamm, Heinz: *See*—
Scholz, Norbert; Vock, Georg Friedrich; Erdmann, Kurt; John, Guenther; Frielingsdorf, Hans; Gruber, Wolfgang; and Mueller-Tamm, Heinz, 4,007,321.
Muller, Erwin: *See*—
Blahak, Johannes; Muller, Erwin; and Kleimann, Helmut, 4,007,239.
Muller, Helmut; Rosenberger, Siegfried; and Schwarzenbach, Kurt, to Ciba-Geigy Corporation. Stabilisers for polyolefines. 4,007,183, Cl. 260-249.800.
Muller, Rolf; Papst, Georg Friedrich; and Schlicker, Volker, to Papst-Motoren KG. Brushless D-C motor. 4,007,390, Cl. 310-90.000.
Mullery, Alvin Paul: *See*—
Haibt, Luther Harold; and Mullery, Alvin Paul, 4,007,450.
Munch, Walter, Jr.: *See*—
Kappes, Joseph L.; Munch, Walter, Jr.; and Uetrecht, Dale M., 4,006,658.
Munk, Miner N., to Varian Associates. Convergent light illuminated flow cell for liquid chromatography. 4,006,990, Cl. 356-246.000.
Murakami, Hisakazu; and Fujiwara, Yasuhiko, to Nissan Motor Co., Ltd. Seat for automobile. 4,006,934, Cl. 297-386.000.
Murakami, Noboru, to Aisin Seiki Kabushiki Kaisha. Fluid pressure control system for motor vehicle transmissions. 4,006,652, Cl. 74-869.000.
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Toda, Toshimasa; Mori, Eiko; Horiuchi, Hideo; Higashida, Susumu; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohta, Noriyuki; and Osawa, Hisayou, to Sankyo Company Limited. Novel piperidine derivatives for the stabilization of synthetic polymers. 4,007,158, Cl. 260-45.8NZ.
Murray, James M. Dish-stabilizers for dish washing machines. 4,006,950, Cl. 312-270.000.
Murray, Kenneth R., to Towmotor Corporation. Cushioning device for a hydraulic jack. 4,006,666, Cl. 91-394.000.
Murray, Robert Thomas: *See*—
Ballard, Denis George Harold; Murray, Robert Thomas; and Jeffs, George Michael Fingland, 4,007,247.
Naber, Jaap E.; and Mink, Bernardus H., to Shell Oil Company. Partial combustion process for manufacturing a purified gas containing hydrogen and carbon monoxide. 4,007,129, Cl. 252-373.000.
Nachtman, Russell L., to United Technologies Corporation. Laser mirror coolant pressure balance means. 4,006,972, Cl. 350-310.000.
Nadon, James W.: *See*—
Anderson, Frank R.; and Nadon, James W., 4,006,651.
Nagai, Masahiko: *See*—
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Nagasaki, Toshihide; Takayama, Masaharu; Uesugi, Akiyoshi; Tanimizu, Isao; and Shintani, Kazuto, to Nippon Shoji Kaisha, Limited. Method for measuring the activity of lecithin cholesterol acyl transferase and lecithin substrate solution useful therefor. 4,007,091, Cl. 195-99.000.
Najmann, Knut: *See*—
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Nakamura, Junpei, to Kabushiki Kaisha Daini Seikosha. Electromechanical filter having a plurality of tuning forks. 4,007,432, Cl. 333-71.000.
Nakamura, Ken: *See*—
Tomono, Makoto; Nakamura, Ken; and Yamakawa, Koichi, 4,006,987.
Nakamura, Norihiko; and Yanagihara, Hiromichi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Compensation apparatus for carburetor. 4,007,237, Cl. 261-41.00D.
Nakamura, Zenzo; Ohtaki, Shohei; Uchiyama, Takashi; and Yokota, Hideo, to Canon Kabushiki Kaisha. Automatic control device for an electronic flash apparatus. 4,007,398, Cl. 315-151.000.
Nakao, Hideo; Yanagisawa, Hiroaki; Nagano, Mitsuo; Shimizu, Bunji; Kaneko, Masakatsu; and Sugawara, Shinichi, to Sankyo Company Limited. Cephalosporin derivatives. 4,007,177, Cl. 260-243.00C.
Narad, Inc.: *See*—
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Narozny, Ronald S., to Thomas & Betts Corporation. Connector. 4,006,957, Cl. 339-103.00M.
National Forge Company: *See*—
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Neddo, Keith S.; Alder, G. Michael; and Gwilliam, James L., Jr., to Native Plants, Inc. Seedling plant propagation container. 4,006,558, Cl. 47-77.000.
Nelson, Alfred Dwayne; and Espelien, Larry E., to Minnesota Mining and Manufacturing Company. Matrix construction for fuel cells. 4,007,058, Cl. 429-34.000.
Nelson, James K., to Fedders Corporation. Apparatus and method for controlling cycles of operation of a dryer. 4,006,535, Cl. 34-55.000.
Nelson Research & Development Company: *See*—
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Neubold, Kurt: *See*—
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Neukom, Chester G.; and Kopecky, Ivyl D., to Haybuster Manufacturing Inc. Lowering device for unloading or loading haystacks. 4,006,833, Cl. 214-506.000.
Neuman, Richard F., to Eaton Corporation. Inflator assembly and flow control valve for same. 4,006,919, Cl. 280-736.000.
Neuschutz, Dieter: *See*—
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New Zealand Inventions Development Authority: *See*—
Smith, Donald Kenneth; and McLachlan, Corran Norman Stuart, 4,007,117.
Newell, William H., to Perkin-Elmer Corporation, The. X, Y, θ alignment mechanism. 4,006,645, Cl. 74-479.000.
Newman, Howard, to American Cyanamid Company. Substituted 1,2,4-triazole carboxamide. 4,007,198, Cl. 260-308.00R.
Newman, Richard W.: *See*—
Moore, William C.; Connors, John D.; and Newman, Richard W., 4,006,738.
Nicolas, Yves, to Schlumberger Technology Corporation. Apparatus

for measuring the diameter of a well bore. 4,006,530, Cl. 33-178.00F.

Niederprum, Hans: *See—*
Adelmann, Siegfried; Margotte, Dieter; Vernaleken, Hugo; Niederprum, Hans; Meussdoerffer, Johann Nikolaus; and Nouvertne, Werner, 4,007,150.

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Nilsson, Karl N. A., to Aktiebolaget Svenska Flaktfabriken. Arrangement for utilizing solar energy for heating buildings. 4,006,856, Cl. 237-1.00A.

Ninomiya, Nobutaka: *See—*
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Nippon Hoso Kyokai: *See—*
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Nippon Telegraph and Telephone Public Corporation: *See—*
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Nishi, Atsuyoshi; Futaguchi, Shizuo; Ishida, Akio; Ito, Toshio; Nomaguchi, Tamotsu; Makino, Toshihiko; and Saito, Tatsuo, to Mitsubishi Denki Kabushiki Kaisha. Room heating apparatus using combustion. 4,006,728, Cl. 126-110.00R.

Nishiguchi, Hisanori: *See—*
Ishida, Eisuke; Takashima, Yuji; Nishiguchi, Hisanori; and Oda, Fujio, 4,007,045.

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Nishino, Shigeru; and Uchida, Tomio, to Caterpillar Mitsubishi Ltd. Two-way bulldozer mechanism. 4,006,782, Cl. 172-806.000.

Nissan Motor Co., Ltd.: *See—*
Hata, Yoshitaka; Ikeura, Kenji; and Iizuka, Haruhiko, 4,006,722.
Ikawa, Kazuo; and Ogawa, Naoki, 4,006,954.
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Nitto Electric Industrial Co., Ltd.: *See—*
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Njos, Lester B.; and Lamb, Gordon L. Electric immersion heater for stock tanks. 4,007,371, Cl. 219-523.000.

Noguchi, Shunsaku; Aono, Tetsuya; Araki, Yoshiaki; and Kawai, Kiyohisa, to Takeda Chemical Industries, Ltd. 4-Benzoylindan-1-carboxamide and derivatives thereof. 4,007,225, Cl. 260-558.00R.

Nomaguchi, Tamotsu: *See—*
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Nonaka, Yasuhiko; Goto, Naohiro; and Shidara, Keiichi, to Hitachi, Ltd.; and Nippon Hoso Kyokai. Target structure for use in photoconductive image pickup tubes. 4,007,395, Cl. 313-386.000.

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Nordson Corporation: *See—*
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Norman Dryer Co., Inc.: *See—*
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Novex Talalmanyfejleszto es Ertekesito Kulkereskedelmi Rt.: *See—*
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Noz, Francis X., to Galentan A.G. Process for selectively applying a metal coating to the metallic parts of elements which pass through an insulator. 4,007,097, Cl. 204-15.000.

Obendorf, Johann: *See—*
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Ochs, Gordon M., to Tidland Corporation. Corrugator. 4,006,671, Cl. 93-59.0CE.

O'Connor, Chadwell. Actuator controlled instrument support stand. 4,006,876, Cl. 248-171.000.

O'Connor, Michael Niall Desmond: *See—*
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Oda, Fujio: *See—*
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O'Farrell, Charles P.: *See—*
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Oganesian, Oganes Vardanovich: *See—*
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Ogawa, Naoki: *See—*
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Ogawa, Shinsaku; Yamanoue, Matsuei; and Oyabu, Norio, to Asahi Kasei Kogyo Kabushiki Kaisha. Polyurethane coating composition. 4,007,151, Cl. 260-31.20N.

Ogirima, Masahiko; Shinoda, Toshimitu; Ono, Yuichi; and Kusumoto, Hajime, to Hitachi, Ltd. Method of making an epitaxial growth layer of $GaAs_{1-x}P_x$ compound semiconductor. 4,007,074, Cl. 148-175.000.

Ohgami, Kazuhiko: *See—*
Ojima, Shin; Ohgami, Kazuhiko; Watanabe, Kazutaka; Yoshimura, Tohru; Katou, Masaya; and Matsuoka, Nozomu, 4,007,364.

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Ohtsuka, Takaaki; Satake, Keigo; Yamazaki, Shiro; and Watanabe, Takeo, to Kureha Kagaku Kogyo Kabushiki Kaisha. Fungicides. 4,007,279, Cl. 424-277.000.

Ojima, Shin; Ohgami, Kazuhiko; Watanabe, Kazutaka; Yoshimura, Tohru; Katou, Masaya; and Matsuoka, Nozomu, to Hoshidenki-Seizo Kabushiki Kaisha. Writing instrument with calculator. 4,007,364, Cl. 235-152.000.

Oka, Masayo: *See—*
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Ollendorf, Joel; and Cestone, Frank J., to RCA Corporation. Semiconductor wafer chuck with built-in standoff for contactless photolithography. 4,006,909, Cl. 279-3.000.

Olsen, Carl Ivar, to Danfoss A/S. Hydraulic Steering apparatus. 4,006,662, Cl. 91-400.000.

Olshansky, Robert, to Corning Glass Works. Communication system having low dispersion glass optical waveguide. 4,006,962, Cl. 350-96.0WG.

Olson, Lloyd C.: *See—*
Cornelius, Gail; and Olson, Lloyd C., 4,006,860.

Omori, Shigenori; and Terada, Fumio, to Yoshida Kogyo Kabushiki Kaisha. Device for shaping and transporting coil fastener elements. 4,006,620, Cl. 72-66.000.

O'Neill, Owen: *See—*
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Ono, Yuichi: *See—*
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Oonuma, Toshio; and Tanaka, Yutaka, to Toyota Jidosha Kogyo Kabushiki Kaisha. Impact energy absorbing apparatus. 4,006,647, Cl. 74-492.000.
Ooraikul, Buncha, to Canadian Patents and Development Ltd. Production of potato granules. 4,007,286, Cl. 426-262.000.
Orange State, Inc.: *See—*
Forbes, William J., 4,006,595.
Ordinaga Llorens, Eliseo, to Cremeal S.A. Simulated tennis game. 4,006,897, Cl. 273-85.00R.
Ordonez, Emil, to Raymond Lee Organization, Inc., The, a part interest. Impact reaction hammer. 4,006,763, Cl. 145-29.00R.
Ort, George M., to A. B. Dick Company. Method of treatment of offset masters prior to conversion. 4,007,046, Cl. 96-33.000.
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Ostreicher, Eugene A., to AMF Incorporated. Fibrous filter medium and process. 4,007,114, Cl. 210-23.00R.
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Patin, Pierre, to Agence Nationale de Valorisation de la Recherche (ANVAR). Lockable articulation. 4,006,916, Cl. 280-282.000.
Patino, Armando; and Maldonado, Bernardo, to Colgate-Palmolive Company. Dental cream. 4,007,259, Cl. 424-49.000.
Paul, William T., to Incom International Inc. Conveyor chain. 4,006,817, Cl. 198-853.000.
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Pedone, John A. Pipe remover. 4,006,521, Cl. 29-282.000.
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Perondi, Giorgio, to FMC Corporation. Straight line gluer. 4,006,704, Cl. 118-50.000.
Perrott, Richard A., Sr. Asphalt sealer mixer. 4,006,889, Cl. 259-176.000.
Persson, Sven-Olof Ingemar. File. 4,006,992, Cl. 402-47.000.
Pertl, Peter. Bi-laminar pre-finished wall element and method of assembling same. 4,006,568, Cl. 52-241.000.
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Petersen, Jorgen, to Kemanord Aktiebolag. Process for reducing polymer build-up. 4,007,320, Cl. 526-62.000.
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Pfouts, Robert R.; Coolidge, Anson S.; and Peter, Daryl D., to United Aircraft Products, Inc. Plate type heat exchanger. 4,006,776, Cl. 165-166.000.
Pham van Cang, Luc, to Thomson-CSF. Circuit for processing a color television signal prior to magnetic recording and corresponding restoring circuit. 4,007,483, Cl. 358-4.000.
Phelps, Peter M. Combination humidifying and cooling apparatus and method. 4,007,241, Cl. 261-149.000.
Phillips Petroleum Company: *See—*
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Pilsner, Victor F.; and Helmer, Merrlin M. Gas tank carrier for camper or trailer. 4,006,852, Cl. 224-42.030.
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gov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Lepnidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 4,007,317.

Pitney-Bowes, Inc.: *See—*
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Placontrol Inc.: *See—*
Chodorow, Ingram S., 4,006,750.

Plummer, William T., to Polaroid Corporation. Reflective imaging apparatus. 4,006,971, Cl. 350-293.000.

Pochan, John M.: *See—*
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Polaroid Corporation: *See—*
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Polva Nederland B.V.: *See—*
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Pont-A-Mousson S.A.: *See—*
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Porter, Stephen G.; and Adams, Theodore J. Fishing lure tray with hinged cover. 4,006,553, Cl. 43-54.50R.

Post, Daniel. Ski boots providing amplification of edging action. 4,006,543, Cl. 36-121.000.

Poy, George Lim; and Sproul, Edward A., to Inmont Corporation. Method of applying aqueous coating compositions. 4,007,306, Cl. 427-377.000.

PPG Industries, Inc.: *See—*
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Pressman, Gerald L.; and Gardiner, Kenneth W., to Electroprint, Inc. Electrostatic color printing systems using modulated ion streams. 4,006,983, Cl. 355-4.000.

Price, William G., to Bendix Corporation, The. Piston and extensible cylinder therefor. 4,006,669, Cl. 92-13.100.

Price, William R.: *See—*
Greaf, Clarence; and Price, William R., 4,006,898.

Prince, Leon M., to Lever Brothers Company. Synthetic detergent bar. 4,007,125, Cl. 252-117.000.

Prince Manufacturing, Inc.: *See—*
Sweeton, Gerard F.; and Head, Howard, 4,006,726.

Pritchard, Alan Bryan: *See—*
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Procter & Gamble Company, The: *See—*
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Protonantis, Peter N. Speed monitoring and ticketing system for a motor vehicle. 4,007,438, Cl. 340-62.000.

Przedsiebiorstwo Projektowania I Dostaw Kompletnych Obiektov Przemyslowych "Chemadx": *See—*
Schroeder, Jerzy; Synowiec, Jerzy; Zrubek, Tadeusz; Gorecki, Henryk; Wolnicki, Zdzislaw; and Hnatowicz, Roman, 4,007,030.

Psaar, Hubertus, to Bayer Aktiengesellschaft. Dyestuff including pyrimido-indole moiety. 4,007,172, Cl. 260-240.900.

Puckett, William E. Battery jump cable apparatus. 4,006,952, Cl. 339-5.0RL.

Puppe, Lothar; Ulisch, Gunter; and Schwochow, Friedrich, to Bayer Aktiengesellschaft. Production of synthetic zeolite of faujasite structure. 4,007,253, Cl. 423-329.000.

Pustka, Karel: *See—*
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Queuille, Andre; and Larde, Raymond, to Roussel-UCLAF. Method of treating diarrhea employing a formaldehyde-modified casein. 4,007,264, Cl. 424-82.000.

R. M. Wade & Co.: *See—*
Cornelius, Gail; and Olson, Lloyd C., 4,006,860.

R. Melzer oHG Machinenbau u. Metallverarbeitung: *See—*
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Raad, Khans Eduardovich: *See—*
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Rabatin, Jacob G., to General Electric Company. Alkali metal alkaline earth metal sulfate phosphor activated with cerium and terbium and lamp containing same. 4,007,394, Cl. 313-486.000.

Raboin, Ronald K.: *See—*
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Radke, Dietrich: *See—*
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Raible, Hermann; Dorer, Wilfried; and Lehmann, Werner, to Mathias Bauerle GmbH, Firma. Sheet distributing device. 4,006,894, Cl. 271-173.000.

Ramey, Chester E.; and Luzzi, John J., to Ciba-Geigy Corporation. Acylated derivatives of substituted piperazines and polymeric compositions stabilized thereby. 4,007,156, Cl. 260-45.80N.

Ramey, Chester E.; and Luzzi, John J., to Ciba-Geigy Corporation. Substituted piperazines and polymeric compositions stabilized thereby. 4,007,157, Cl. 260-45.80N.

Randina, Larisa Vasilievna: *See—*
Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Lepnidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 4,007,317.

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Rao, Purushothama; and Mao, George W., to Gould Inc. Lead base cadmium-tin alloy useful for forming battery components. 4,007,056, Cl. 429-222.000.

Rauth, Peter: *See—*
Schleicher, Rudolf; Walther, Juergen; Schoenberg, Karl-Heinz; and Rauth, Peter, 4,007,022.

Ray, Leonard N., Jr.: *See—*
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RCA Corporation: *See—*
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Wetsel, Grover C., Jr., 4,007,462.

Recupero, Thomas A. Door handle attachment. 4,006,927, Cl. 292-336.300.

Redford, David A.; and Creighton, Stephen M., to Texaco Exploration Canada Ltd. Thermal recovery of hydrocarbon from tar sands. 4,006,778, Cl. 166-261.000.

Redken Laboratories, Inc.: *See—*
Patel, Kanu I., 4,007,005.

Redmon, Jackson T.; Haidle, Irvin; Herzog, Donald; and Greene, Joel C., to Agribest, Inc. Farrowing crate assembly. 4,006,715, Cl. 119-20.000.

Reed International Limited: *See—*
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Reichelt, Achim: *See—*
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Reichenberger, Jurgen: *See—*
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Reisman, Arnold: *See—*
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Reiterer, Ferdinand, to Societe Anonyme des Etablissements Neu. Method and apparatus for separating and distributing fibrous materials. 4,006,938, Cl. 302-59.000.

Rektorat University Palackeho v Olomouci: *See—*
Halek, Jan; and Jezdinsky, Jaroslav, 4,007,420.

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Remshardt, Rolf: *See—*
Heuber, Klaus; Klein, Wilfried; Najmann, Knut; Remshardt, Rolf; and Wiedmann, Siegfried K., 4,007,451.

Renn, Robert Maurice: *See—*
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Research Corporation: *See—*
La Londe, Robert Thomas; Tsai, Amy Inn-Mei; Wang, Chun Juan; and Wong, Chunfook, 4,007,277.

Resnick, Sam L. Eyeglass structure. 4,006,974, Cl. 351-59.000.

Restaurant Technology, Inc.: *See—*
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Reuter, Peter: *See—*
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Reynolds, Jefferson W., to Eastman Kodak Company. Nitrile hydrogenation process. 4,007,226, Cl. 260-563.00D.

Reznikova, Svetlana Stepanovna: *See—*
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Rhone-Poulenec S.A.: *See—*
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Rich, Walter. Garment hanger. 4,006,826, Cl. 211-101.000.

Richardson, Kenneth: *See—*
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Richter, George N.: *See—*
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Ridgeway, John Jerold, to Imperial Chemical Industries Limited. Safe detonator device. 4,006,687, Cl. 102-28.00R.

Riebel, Hans-Jochem: *See—*
Maurer, Fritz; Riebel, Hans-Jochem; Rohe, Lothar; Hammann, Ingeborg; and Homeyer, Bernhard, 4,007,269.

Riediger, Craig W.: *See—*
Starling, James G.; Wait, Jay J.; and Riediger, Craig W., 4,006,808.

Rimhagen, Bengt Ingemar, to Linkoepings Transportindustri AB. Low height semi-trailer. 4,006,913, Cl. 280-43.130.

Ring, Michael; Godsay, Madhu P.; Swenson, Roy S.; and Kent, Joseph N., to International Paper Company. Method for forming wet-laid non-woven webs. 4,007,083, Cl. 162-101.000.

Risdon Manufacturing Company, The: *See—*
Corris, Charles James, 4,006,844.

Rizzo, John. Bite indicating fishing light. 4,006,550, Cl. 43-17.000.

Robert Bosch G.m.b.H.: *See—*
Roll, Karl; and Fritschi, Klaus-Peter, 4,006,785.

Robertshaw Controls Company: *See—*
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Robertson, Andrew, to Sterling Drug Inc. Dermatalogical compounds and compositions. 4,007,271, Cl. 424-234.000.

Robertson, Joe E., to Kirsch Company. Floating presser foot for quilting machine. 4,006,696, Cl. 112-117.000.

Robertson, Joe E., to Kirsch Company. High speed quilting machine. 4,006,697, Cl. 112-118.000.

Robinson, Joseph D. Engine muffler apparatus providing acoustic silencer. 4,006,793, Cl. 181-53.000.

Robinson, Paul Harvey; and Ronen, Ram Shaul, to RCA Corporation. Method of treating semiconductor device to improve its electrical characteristics. 4,007,297, Cl. 427-93.000.

Rocholl, Henning: *See—*
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Rockwell International Corporation: *See—*
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Rogers, Howard D.: *See—*
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Rogers, Maxmillian P.: *See—*
Lohr, Raymond J.; Carver, Richard N.; Kienholz, Charles M.; Cook, Calvin S.; and Rogers, Maxmillian P., 4,006,899.

Rohe, Lothar: *See—*
Maurer, Fritz; Riebel, Hans-Jochem; Rohe, Lothar; Hammann, Ingeborg; and Homeyer, Bernhard, 4,007,269.

Roll, Karl; and Fritschi, Klaus-Peter, to Robert Bosch G.m.b.H. Power tool. 4,006,785, Cl. 173-12.000.

Rolls-Royce (1971) Limited: *See—*
Ford, David Alan, 4,006,891.

Romanski, Eric R.; and Stevens, Orrin C., to Albany International Corporation. Fabric connector seam. 4,006,760, Cl. 139-383.00A.

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Roox, Ivar Kharaldovich: *See—*
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Rose, Andrew M., to Sperry Rand Corporation. Rotational speed monitor. 4,007,492, Cl. 360-75.000.

Rosenberg, William E., to Columbia Chemical Corporation. Baths and additives for the electrodeposition of bright zinc. 4,007,098, Cl. 204-55.00R.

Rosenberger, Siegfried: *See—*
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Rossetti, Vittorio: *See—*
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Rossi, Ronald C.; and Carnahan, Robert D., to United States of America, Air Force. Thermal shock resistant ceramic composite. 4,007,049, Cl. 106-58.000.

Rothe, Werner: *See—*
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Roussel-UCLAF: *See—*
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Queuille, Andre; and Larde, Raymond, 4,007,264.

Royal, Thomas B., to International Paper Company. Method and apparatus for forming a collapsed box. 4,006,670, Cl. 93-53.00M.

Rubner, Hugo G.; and Spreng, Robert R., to Briggs and Stratton Corporation. Weather sealed lock mechanism. 4,006,616, Cl. 70-455.000.

Rudolph, Richard C.; Henkel, Ernest J.; Glandt, Michael A.; and Seichter, Daniel J., to Giddings & Lewis, Inc. Turret lathe. 4,006,518, Cl. 29-39.000.

Ruf, Wolfgang: *See—*
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Rumplestiltskin's Craft Shop, Inc.: *See—*
Thaheld, Fred A.; and Thaheld, Fred H., 4,006,694.

Rumpp, Gerhard; Gartner, Karl-Heinz; and Kruger, Wilm, to Hilti Aktiengesellschaft. Drilling tool with drill and receiving element. 4,006,787, Cl. 173-132.000.

Rupert, Samuel J., to Hoover Ball and Bearing Company. Method of blow molding. 4,007,243, Cl. 264-89.000.

Rupinski, Fredrick A.: *See—*
Kahan, William; Rogers, Howard D.; and Rupinski, Fredrick A., 4,006,611.

Ruppe, Charles R., to Deering Milliken Research Corporation. Process for imparting a crushed appearance to pile fabric. 4,006,516, Cl. 26-2.00R.

Russell, Taft B., to Edison Control Corporation. Distance-related variable gain amplifier. 4,007,340, Cl. 179-170.00R.

Rust, Kurt; Schrott, Erwin; Strametz, Helmut; and Kablitz, Hans-Jurgen, to Hoechst Aktiengesellschaft. Process for the manufacture of a catalyst. 4,007,132, Cl. 252-429.00B.

Rust, Kurt; Schrott, Erwin; and Strametz, Helmut, to Hoechst Aktiengesellschaft. Process for the manufacture of a catalyst. 4,007,133, Cl. 252-429.00B.

Rusteberg, Robert K.; and Froehlich, Robert J. Semen thaw system. 4,007,367, Cl. 219-385.000.

Rustecki, Romuald Zdzislaw. Electric induction drive assemblies. 4,007,386, Cl. 310-42.000.

Rustecki, Romuald Zdzislaw. Electrical synchronous machines. 4,007,387, Cl. 310-42.000.

Ruzicka, Josef; and Ruzicka, Petr O. Method and apparatus for evalu-

ating rebounding characteristics of objects. 4,006,626, Cl. 73-13.000.
Ruzicka, Petr O.: *See*—
Ruzicka, Josef; and Ruzicka, Petr O., 4,006,626.
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Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Lepnidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 4,007,317.
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Schulz, Donald A., 4,006,560.
Sack, Werner; and Scheidler, Herwig, to Jenaer Glaswerk Schott & Gen. Dark red transparent refractory glass. 4,007,048, Cl. 106-39.700.
Sadler, Thomas Harry; and Cerny, Ronald Neal, to Johns-Manville Corporation. Joint assembly for insulating high temperature fluid carrying conduits. 4,006,920, Cl. 285-14.000.
Safe-Lite, Inc.: *See*—
Decker, Wilton K., 4,006,614.
Safety Engineering, Inc.: *See*—
Whittaker, Thomas F., 4,007,379.
Safir, Sidney Robert, to American Cyanamid Company. Substituted benzodiazepin-10-ones in treating pain and depression. 4,007,272, Cl. 424-248.510.
St. Cyr, Napoleon. Road buoy. 4,006,702, Cl. 116-63.00P.
St. Jacques, Gerald A., to NCR Corporation. Magnetic induction type transducer means. 4,006,628, Cl. 73-141.00A.
St. John, Daniel S., to Holotron Corporation. Holographic color television record. 4,007,481, Cl. 358-2.000.
Saito, Kojiro, to Yutaka Seimitsu Kogyo Ltd.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Cutting feed starting position control device for machine. 4,007,411, Cl. 318-630.000.
Saito, Masashi. Antilock system for wheeled vehicles. 4,006,942, Cl. 303-109.000.
Saito, Tatsuo: *See*—
Nishi, Atsuyoshi; Futaguchi, Shizuo; Ishida, Akio; Ito, Toshio; Nomaguchi, Tamotsu; Makino, Toshihiko; and Saito, Tatsuo, 4,006,728.
Sale, Amedeo Omodei; Consonni, Pietro; and Lerner, Leonard J., to Gruppo Lepetit, S.p.A. Triazolo isoindole derivatives. 4,007,276, Cl. 424-263.000.
Salisbury, Leroy J., to United States of America, Army. Temperature sensor using pulse width modulator for duty cycle control. 4,007,425, Cl. 328-3.000.
Salkov, Vladimir Alexandrovich: *See*—
Vainer, Shimon Abramovich; Temerev, Anatoly Fedorovich; Vainer, Savely Abramovich; Nikulin, Sergei Sergeevich; Kheifets, Matvei Evseevich; Usoltsev, Vadim Anatolievich; Matveev, Evgeny Fedorovich; Kazakov, Georgy Petrovich; Salkov, Vladimir Alexandrovich; and Malinin, Anatoly Isidorovich, 4,006,890.
Sallee, John P.; Speight, Bill W.; and McLain, Bruce H., to Air Control Industries, Inc. Portable electrostatic air cleaner. 4,007,024, Cl. 55-126.000.
Sampson, Roy John: *See*—
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Samuels, Howard; and Phillips, Robert, to Warbern Packaging Industries, Inc. Garment hanger with indicia means. 4,006,547, Cl. 40-322.000.
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Schexnayder, Lawrence Francis, to Caterpillar Tractor Co. Air pressure modulated brake valve system. 4,006,939, Cl. 303-71.000.
Schickfluss, Rudolf, to Hoechst Aktiengesellschaft. Process for preparing 1-(N-β-cyanethylaminol-3-acylaminobenzenes. 4,007,213, Cl. 260-465.00D.
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Schirmer, Robert M.,to Phillips Petroleum Company. Combustors and methods of operating same. 4,007,002, Cl. 431-10.000.
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Simpson, Elwood J. Unitary sunshield for an automobile. 4,006,933, Cl. 296-95.00R.

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Slater, William L.; Richter, George N.; Crouch, William B.; and Estabrook, Lawrence E., to Texaco Inc. Production of clean synthesis or fuel gas. 4,007,019, Cl. 48-197.00R.

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Societe anonyme dite: Societe Internationale pour l'Innovation: *See—*
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Soldavini, Alfred C. Tennis racket. 4,006,896, Cl. 273-73.00J.

Solomon, Elias F., to Gulf & Western Manufacturing Company (Systems). Ionization detector with improved radiation source. 4,007,374, Cl. 250-384.000.

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Sorensen, Dennis Dean; Erickson, Richard Allan; and Iepson, Harry Ellwood, to Gould Inc. Plastic case for flat rechargeable cell. 4,007,060, Cl. 429-53.000.

Sorensen, Steven G.: *See—*
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Sorenson, James L.; Pannier, Karl A., Jr.; and Reynolds, Gordon S., to Sorenson Research Co., Inc. Autologous transfusion system and method. 4,006,745, Cl. 128-214.00R.

Sorenson Research Co., Inc.: *See—*
Sorenson, James L.; Pannier, Karl A., Jr.; and Reynolds, Gordon S., 4,006,745.

Sorrentino, Ralph P.; and Like, Burton M., to Millmaster Onyx Corporation. Pearlescent hair conditioner. 4,007,261, Cl. 424-70.000.

Soto, Ricardo Hurtado. Sterile bag pad. 4,006,823, Cl. 206-554.000.

Sourgens, Jacques; Lajotte, Dominique; and Michelon, Francois, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Echo cancelling device. 4,007,341, Cl. 179-170.200.

Southard, Robert Keith: *See—*
Hopkins, John Root; Renn, Robert Maurice; and Southard, Robert Keith, 4,006,959.

Spatz, Jurgen: *See—*
Gurkaynak, Erdal; Spatz, Jurgen; Vogelsberg, Dieter; and Liedtke, Gerhard, 4,006,582.

Speicher, Edwin W., to M. E. Cunningham Company. Power actuated portable marking tool. 4,006,786, Cl. 173-15.000.

Speicher, Melvin E.: *See—*
Bowles, Arnold G.; Crum, Andrew S. D.; and Speicher, Melvin E., 4,007,325.

Speight, Bill W.: *See—*
Sallee, John P.; Speight, Bill W.; and McLain, Bruce H., 4,007,024.

Spencer, Audley V. Swivel or rotating coupling. 4,006,924, Cl. 285-190.000.

Spencer, Christopher Buxton: *See—*
Hayden, Percy; Sampson, Roy John; Spencer, Christopher Buxton; and Pinnegar, Harry, 4,007,135.

Spencer, William Wilfred. Springs. 4,006,893, Cl. 267-61.00S.

Sperry Rand Corporation: *See—*
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Sprecher & Schuh AG: *See—*
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Springer, Willard J.; and Baker, Bruce A., Jr., to Kaiser Aluminum & Chemical Corporation. Electrocoating aluminum sheet or strip. 4,007,102, Cl. 204-181.000.

Sproul, Edward A.: *See—*
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Spurkel, Hermann. Means for maintaining a painting against shrinkage and warping. 4,006,771, Cl. 160-378.000.

Squassoni, Gino F.; and Jackson, Earl V., to Xerox Corporation. Photoelectrophoretic concurrent process cycling. 4,006,982, Cl. 355-3.00P.

Squires, Arthur M. Treating gas and granular material in panel bed. 4,006,533, Cl. 34-33.000.

Squires, Richard Felt: *See—*
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Stacy, Peter M.; and Weitzel, Richard A., to Eastman Kodak Company. Electrographic development apparatus. 4,006,708, Cl. 118-650.000.

Stahl, Jurgen: *See—*
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Standard Oil Company: *See—*
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Starling, James G.; Wait, Jay J.; and Riediger, Craig W., to Caterpillar Tractor Co. Controls for a centrifugal fluid clutch. 4,006,808, Cl. 192-103.0FA.

Startsev, Vadim Nikolaevich: *See—*
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Steer, Peter Leslie, to Abbott Laboratories. Locking cannula mount. 4,006,744, Cl. 128-214.00R.

Steiger, Anton, to Sulzer Brothers Limited. Hydrostatic piston machine having a cylindrical mounting pin. 4,006,668, Cl. 91-497.000.

Stein, Thomas R.: *See—*
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Stempfle, Hans; and Rothe, Werner, to Siemens Aktiengesellschaft. Lighting fixture with tiltable reflector elements. 4,007,365, Cl. 240-41.35F.

Stepe, Visvaldis A., to Caterpillar Tractor Co. Replaceable cutting edge assembly. 4,006,544, Cl. 37-141.00T.

Sterling Drug Inc.: *See—*
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Stevens, Orrin C.: *See—*
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Stockman, Leon: *See—*
Stockman, Suzanne; and Stockman, Leon, 4,006,690.

Stockman, Suzanne; and Stockman, Leon. Mechanism for firing a projectile such as a rifle grenade. 4,006,690, Cl. 102-80.000.

Stoeckli, Hans: *See—*
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Stofko, Jan; and Zavarin, Eugene, to University of California, The Regents of the. Method of bonding solid lignocellulosic material, and resulting product. 4,007,312, Cl. 428-420.000.

Stolka, Milan; and Turner, Sam R., to Xerox Corporation. Photoconductive elements with copolymer charge transport layers. 4,007,043, Cl. 96-1.0PC.

Stoll, Russell F.: *See—*
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Stolz, Owen M. Wall structure and manufacturing method therefor. 4,006,570, Cl. 52-432.000.

Stone, Dean Henry: *See—*
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Stork Brabant B.V.: *See—*
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Strickland, Robert V. Packaging and applicator tool for electrical terminals. 4,006,502, Cl. 7-5.400.

Stryk, Rudolf: *See—*
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Stucke, Arthur W.; and Taylor, Richard P., to NCR Corporation. Card retrieval means. 4,007,356, Cl. 235-61.11R.

Stultz, Frederick L.; and Clark, George C., to Acme Scale Company. Scale for weighing hospital patients in their horizontal position. 4,006,789, Cl. 177-126.000.

Sturmer, David Michael: *See—*
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Summers, John Gilbert; Josh, Michael John; and Ayling, Mildred Avis, to U.S. Philips Corporation. Mesa fabrication process. 4,007,104, Cl. 204-192.000.

Sun Chemical Corporation: *See—*
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Sunada, Masayoshi: *See—*
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Sutton, John F. Deflection system for cathode ray oscilloscope. 4,007,400, Cl. 315-364.000.

Svenska Luftkompressor AB: *See—*
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Swann, George R.: *See—*
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Sweeton, Gerard F.; and Head, Howard, to Prince Manufacturing, Inc. Oscillator type ball deflector. 4,006,726, Cl. 124-81.000.

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Schroeder, Jerzy; Synowiec, Jerzy; Zrubek, Tadeusz; Gorecki, Henryk; Wolnicki, Zdzislaw; and Hnatowicz, Roman, 4,007,030.

Szatmari, Gabor. Voltage regulating transformer. 4,007,416, Cl. 323-60.000.

Szkrybalo, William, to Hoffmann-La Roche Inc. 2,3:4,6-Di-O(substituted)-2-keto-L-gulonic acid, salts and esters. 4,007,206, Cl. 260-340.700.

Szova, Janos. Axial tumbler lock. 4,006,615, Cl. 70-363.000.

Takada, Ryosaku; and Joma, Akemi. Projection screen. 4,006,965, Cl. 350-117.000.

Takagi, Hiromu: *See—*
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Takagi, Yasuo; Hioki, Kazuo; and Aoyama, Syunichi, to Nissan Motor Co., Ltd. Control apparatus for exhaust gas recirculation system. 4,006,721, Cl. 123-119.00A.

Takahama, Hiroshi: *See—*
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Takayanagi, Toshiaki; Tsubakihara, Hiroaki; and Fukuyama, Hiroshi, to Bridgestone Tire Company Limited. Radial tires. 4,006,766, Cl. 152-354.000.
Takayanagi, Toshiaki; Tsubakihara, Hiroaki; and Fukuyama, Hiroshi, to Bridgestone Tire Company Limited. Process for making radial tires. 4,007,069, Cl. 156-123.000.
Takeda Chemical Industries, Ltd.: *See—*
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Takeuchi, Shinjiro; Ichioka, Satoshi; Shirosaka, Masaki; and Inoue, Tadashi, to Mishima Kosan Co., Ltd. Thin film magnetometer using an orthogonal flux gate. 4,007,417, Cl. 324-43.00R.
Takigawa, Tomoshi: *See—*
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Tamaru, Munetaka; Kume, Kazunari; Watanabe, Minoru; and Ohno, Hideshi, to Citizen Watch Co., Ltd. Electronic timepiece with electrochromic display element. 4,006,585, Cl. 58-50.00R.
Tamaru, Yoshinao: *See—*
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Tamm, Per-Henric Sebastian. Photo-electric depth or turbidity meter for fluid suspensions. 4,005,988, Cl. 356-4.000.
Tan, Hong Sheng: *See—*
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Thiel, Alfons W.; and Hell, Hans, to Bellaplast GmbH. Container with snap cover having frangible portions. 4,006,839, Cl. 220-266.000.
Thies, Alfred. Apparatus for the wet processing of textile strands. 4,006,612, Cl. 68-177.000.
Thoma, Frank, to Daimler-Benz Aktiengesellschaft. Fuel injection nozzle for internal combustion engines. 4,006,859, Cl. 239-89.000.
Thoma, Gustav; Tscharf, Fritz; and Astinet, Helmut, to Pflanz-Frisch Transportsack GmbH. Plant package and method of preparing the same. 4,006,561, Cl. 47-58.000.
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Thore, Thomas J., to Glenoit Mills, Inc. Method and apparatus for feeding plural slivers selectively to a high pile fabric knitting machine. 4,006,610, Cl. 66-9.00B.
Thurgood, Garry, to British Petroleum Company Limited, The. Control of chokes. 4,007,380, Cl. 307-149.000.
Tice, Richard P.; and Galbraith, Donald L. Fishhook remover and leader storage device. 4,006,554, Cl. 43-57.50R.
Tidland Corporation: *See—*
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Tomono, Makoto; Nakamura, Ken; and Yamakawa, Koichi, to Konishiroku Photo Industry Co., Ltd. Apparatus for cleaning a residual toner on an electrostatic recording medium. 4,006,987, Cl. 355-15.000.
Tooka, Takuzo, to Daiwa Boseki Kabushiki Kaisha; and Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Method and apparatus for carrying out doffing and donning operation. 4,006,864, Cl. 242-35.50R.
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Varta Batterie Aktiengesellschaft: *See—*
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Veitl, Giswalt, to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft. Process of producing surface-decarburized steel sheets or plates. 4,007,064, Cl. 148-12.100.

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Verber, Carl M.: *See—*
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Vercesi, Giacomo, to Honeywell Information Systems Italia. Control device for local connection of a peripheral unit through a modem interface for remote connection. 4,007,449, Cl. 340-172.500.

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Vidalin, Jacques Marie, to Phoebe S. A. Electric commutator-switch and method for assembling it. 4,006,526, Cl. 29-622.000.

Vignini, Walter R. Counterbalance for handgun. 4,006,548, Cl. 42-1.00W.

Vlahos, Petro, to Association of Motion Picture and Television Producers Inc., The. Electronic composite photography with color control. 4,007,487, Cl. 358-22.000.

Vock, Georg Friedrich: *See—*
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Von Esch, Anne Mary; and Crovetti, Aldo Joseph, to Abbott Laboratories. 3,5-Substituted-1,2,4-oxadiazole inner quaternary ammonium salts. 4,007,185, Cl. 260-251.00R.

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Vourron, Bernard: *See—*
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Vuceta, Ivan N., to Consolidated Devices, Inc. Torque release drive coupling. 4,006,608, Cl. 64-29.000.

Vuilleumier, Raymond, to Centre Electronique Horloger S.A. Electronic display device for timepiece and the like. 4,006,583, Cl. 58-23.00C.

W. H. Brady Co.: *See—*
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Wachter, Erich, to Sulzer Brothers Limited. Machine for connecting workpieces, especially pipe bend segments or the like. 4,006,520, Cl. 29-243.520.

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Wade, Peter C.; and Vogt, Berthold Richard, to E. R. Squibb & Sons, Inc. 2-(Piperidinyl or tetrahydropyridinyl)-alkyl)-2,3-dihydro-3-hydroxy-1H-benz(DE)isoquinolin-1-ones. 4,007,191, Cl. 260-288.0CF.

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Wagensonner, Eduard: *See—*
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Waldes Kohinoor, Inc.: *See—*
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Walker, Leigh E., to Hooker Chemicals & Plastics Corporation. Method of preparing vinyl halide polymers and copolymers with polyolefins. 4,007,235, Cl. 260-878.00R.

Wallouch, Rudolph W., to Airco, Inc. Nipple for electrode joint. 4,007,324, Cl. 13-18.000.

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Wannyn, Albrecht Leo Pieter, to Hamido B.V. Packaging shell with hinged bottom wall. 4,006,818, Cl. 206-564.000.

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Weber, Theodor: *See*—
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Webster, Walter C., III; and Allen, Frank L., Jr., to Rockwell International Corporation. Acrylic modified urethane bobbin finish. 4,006,866, Cl. 242-118.320.

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Wells, Thomas R., to Bell & Howell Company. Microfiche carrier. 4,006,980, Cl. 353-118.000.

Werntz, Charles W., to Alvey Inc. Article transporting conveyor. 4,006,815, Cl. 198-781.000.

Werntz, Charles W., to Alvey Inc. Article antiscrambling and accumulating roller conveyor. 4,006,816, Cl. 198-781.000.

Wessner, Harald, to Vockenhuber, Karl; and Hauser, Raimund. Position determining device. 4,007,383, Cl. 250-237.00G.

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Wetterhorn, Richard H., to Dresser Industries, Inc. Temperature compensation for liquid filled pressure gauge. 4,006,639, Cl. 73-393.000.

Whalen, Joseph J. Paint loading applicator for a painting pad or brush. 4,006,991, Cl. 401-121.000.

Wheatland, David A., to Scott Paper Company. Electrophotographic master conversion solution. 4,007,126, Cl. 252-182.000.

Wheeling Closure Corporation: *See*—
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Whittaker, Thomas F., to Safety Engineering, Inc. Operating curcuit for machines. 4,007,379, Cl. 307-115.000.

Whittingham, M. Stanley, to Exxon Research and Engineering Company. Preparation of stoichiometric titanium disulfide. 4,007,055, Cl. 423-565.000.

Widener, Maurice Ward, to United States of America, Navy. Acoustic foghorn for directional signaling. 4,007,437, Cl. 340-16.00R.

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Wiese, Harold. Foldable hand rail and seating structure. 4,006,564, Cl. 52-9.000.

Wiley, Ralph; and Veach, Charley L., to Western Company of North America, The. Radioactive tracer profiling system and apparatus. 4,007,366, Cl. 250-260.000.

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B 48,560	4,002,772	Mar. 30, 1976	Jan. 11, 1977	B 386,828	3,992,440	Feb. 3, 1976	Nov. 16, 1976
B 54,859	4,000,101	Feb. 17, 1976	Dec. 28, 1976	B 387,337	D 243,157	Mar. 16, 1976	Jan. 25, 1977
B 59,512	3,999,216	Mar. 16, 1976	Dec. 21, 1976	B 389,155	4,000,970	Mar. 30, 1976	Jan. 4, 1977
B 73,017	4,001,879	Mar. 9, 1976	Jan. 4, 1977	B 389,304	3,986,829	Jan. 27, 1976	Oct. 19, 1976
B 78,315	3,982,192	Feb. 10, 1976	Sep. 21, 1976	B 390,031	3,985,799	Jan. 13, 1976	Oct. 12, 1976
B 79,099	3,982,177	Jan. 13, 1976	Sep. 21, 1976	B 390,408	3,992,426	Feb. 3, 1976	Nov. 16, 1976
B 97,259	3,999,614	Mar. 9, 1976	Dec. 28, 1976	B 390,979	4,003,850	Mar. 23, 1976	Jan. 18, 1977
B 105,006	4,007,074	Mar. 23, 1976	Feb. 8, 1977	B 391,473	3,988,370	Mar. 2, 1976	Oct. 26, 1976
B 111,130	4,001,380	Mar. 16, 1976	Jan. 4, 1977	B 391,797	3,988,046	Mar. 9, 1976	Oct. 26, 1976
B 150,142	3,981,767	Jan. 27, 1976	Sep. 21, 1976	B 391,844	3,999,165	Mar. 16, 1976	Dec. 21, 1976
B 160,045	3,983,446	Jan. 13, 1976	Sep. 28, 1976	B 392,798	3,996,249	Mar. 30, 1976	Dec. 7, 1976
B 160,099	3,987,221	Jan. 13, 1976	Oct. 19, 1976	B 394,248	3,989,764	Jan. 27, 1976	Nov. 2, 1976
B 163,463	3,981,659	Jan. 27, 1976	Sep. 21, 1976	B 394,350	3,982,200	Jan. 13, 1976	Sep. 21, 1976
B 167,470	4,001,101	Mar. 2, 1976	Jan. 4, 1977	B 395,554	3,998,156	Mar. 9, 1976	Dec. 21, 1976
B 181,208	4,001,391	Mar. 9, 1976	Jan. 4, 1977	B 395,975	4,001,085	Mar. 2, 1976	Jan. 4, 1977
B 200,759	3,986,872	Feb. 3, 1976	Oct. 19, 1976	B 396,164	3,989,590	Feb. 3, 1976	Nov. 2, 1976
B 208,916	3,987,106	Jan. 13, 1976	Oct. 19, 1976	B 396,377	D 243,148	Apr. 6, 1976	Jan. 25, 1977
B 214,925	3,997,648	Mar. 9, 1976	Dec. 14, 1976	B 397,674	3,998,438	Mar. 16, 1976	Dec. 21, 1976
B 223,678	3,989,159	Mar. 9, 1976	Nov. 2, 1976	B 398,084	3,996,239	Feb. 3, 1976	Dec. 7, 1976
B 231,416	4,000,054	Mar. 30, 1976	Dec. 28, 1976	B 398,220	3,990,834	Feb. 3, 1976	Nov. 9, 1976
B 236,342	4,001,182	Feb. 10, 1976	Jan. 4, 1977	B 398,488	3,987,991	Feb. 24, 1976	Oct. 26, 1976
B 248,240	3,983,556	Jan. 13, 1976	Sep. 28, 1976	B 399,098	3,997,665	Feb. 24, 1976	Dec. 14, 1976
B 257,143	4,000,111	Mar. 16, 1976	Dec. 28, 1976	B 399,632	4,001,046	Mar. 9, 1976	Jan. 4, 1977
B 270,274	3,982,223	Feb. 17, 1976	Sep. 21, 1976	B 399,908	3,983,323	Jan. 13, 1976	Sep. 28, 1976
B 270,351	3,997,893	Mar. 30, 1976	Dec. 14, 1976	B 400,871	3,988,893	Feb. 17, 1976	Nov. 2, 1976
B 271,743	4,001,195	Mar. 16, 1976	Jan. 4, 1977	B 401,042	D 242,197	Mar. 16, 1976	Nov. 9, 1976
B 276,026	3,992,405	Feb. 3, 1976	Nov. 16, 1976	B 402,162	3,994,902	Mar. 2, 1976	Nov. 30, 1976
B 279,415	4,000,697	Mar. 16, 1976	Jan. 4, 1977	B 402,328	3,995,545	Apr. 6, 1976	Dec. 7, 1976
B 279,969	3,986,073	Jan. 13, 1976	Oct. 12, 1976	B 402,553	3,983,219	Feb. 17, 1976	Sep. 28, 1976
B 283,941	3,995,313	Feb. 3, 1976	Nov. 30, 1976	B 402,929	3,991,251	Feb. 3, 1976	Nov. 9, 1976
B 288,757	4,001,072	Mar. 30, 1976	Jan. 4, 1977	B 403,243	3,996,232	Mar. 30, 1976	Dec. 7, 1976
B 301,143	3,991,107	Jan. 27, 1976	Nov. 9, 1976	B 403,326	4,001,212	Mar. 23, 1976	Jan. 4, 1977
B 302,160	3,985,774	Feb. 3, 1976	Oct. 12, 1976	B 403,477	3,995,315	Feb. 3, 1976	Nov. 30, 1976
B 306,668	3,985,713	Feb. 3, 1976	Oct. 12, 1976	B 403,507	3,982,095	Feb. 10, 1976	Sep. 21, 1976
B 307,698	3,993,763	Feb. 3, 1976	Nov. 23, 1976	B 403,766	3,994,834	Feb. 10, 1976	Nov. 30, 1976
B 308,659	3,981,947	Jan. 27, 1976	Sep. 21, 1976	B 403,883	4,001,481	Mar. 23, 1976	Jan. 4, 1977
B 311,450	3,988,976	Mar. 9, 1976	Nov. 2, 1976	B 405,726	3,981,241	Jan. 13, 1976	Sep. 21, 1976
B 313,280	4,003,591	Apr. 6, 1976	Jan. 18, 1977	B 406,546	D 242,966	Mar. 16, 1976	Jan. 11, 1977
B 326,211	3,988,272	Mar. 23, 1976	Oct. 26, 1976	B 407,205	4,000,966	Mar. 16, 1976	Jan. 4, 1977
B 328,116	4,000,774	Mar. 9, 1976	Jan. 4, 1977	B 407,737	3,992,546	Feb. 3, 1976	Nov. 16, 1976
B 330,719	4,001,121	Mar. 16, 1976	Jan. 4, 1977	B 409,848	3,983,270	Jan. 27, 1976	Sep. 28, 1976
B 330,736	3,996,299	Feb. 3, 1976	Dec. 7, 1976	B 410,074	4,001,303	Feb. 24, 1976	Jan. 4, 1977
B 332,442	4,001,231	Mar. 30, 1976	Jan. 4, 1977	B 410,694	3,995,530	Mar. 23, 1976	Dec. 7, 1976
B 333,110	3,989,867	Mar. 16, 1976	Nov. 2, 1976	B 411,471	3,982,933	Feb. 17, 1976	Sep. 28, 1976
B 333,247	4,001,201	Mar. 16, 1976	Jan. 4, 1977	B 411,624	4,001,205	Mar. 16, 1976	Jan. 4, 1977
B 333,838	4,006,263	Mar. 23, 1976	Feb. 1, 1977	B 411,765	3,993,428	Feb. 24, 1976	Nov. 23, 1976
B 336,754	3,989,805	Mar. 16, 1976	Nov. 2, 1976	B 412,068	3,981,244	Jan. 13, 1976	Sep. 21, 1976
B 337,823	4,002,746	Mar. 23, 1976	Jan. 11, 1977	B 412,124	4,007,000	Mar. 23, 1976	Feb. 8, 1977
B 339,194	3,982,215	Feb. 3, 1976	Sep. 21, 1976	B 413,379	4,001,325	Mar. 9, 1976	Jan. 4, 1977
B 339,446	4,001,067	Feb. 24, 1976	Jan. 4, 1977	B 414,028	3,993,738	Feb. 17, 1976	Nov. 23, 1976
B 340,170	4,000,444	Mar. 30, 1976	Dec. 28, 1976	B 414,266	3,993,614	Feb. 10, 1976	Nov. 23, 1976
B 347,661	3,999,218	Mar. 16, 1976	Dec. 21, 1976	B 414,481	3,982,979	Jan. 20, 1976	Sep. 28, 1976
B 348,433	3,984,405	Feb. 3, 1976	Oct. 5, 1976	B 414,971	D 242,208	Feb. 10, 1976	Nov. 9, 1976
B 349,370	3,989,684	Jan. 27, 1976	Nov. 2, 1976	B 415,021	3,994,173	Mar. 2, 1976	Nov. 30, 1976
B 351,455	4,001,309	Feb. 24, 1976	Jan. 4, 1977	B 415,122	3,997,503	Feb. 10, 1976	Dec. 14, 1976
B 354,959	3,995,996	Feb. 17, 1976	Dec. 7, 1976	B 416,257	4,001,335	Mar. 16, 1976	Jan. 4, 1977
B 356,187	3,981,222	Jan. 20, 1976	Sep. 21, 1976	B 416,589	3,990,363	Jan. 27, 1976	Nov. 9, 1976
B 357,526	4,001,319	Mar. 23, 1976	Jan. 4, 1977	B 417,014	3,981,851	Jan. 13, 1976	Sep. 21, 1976
B 358,260	3,989,661	Mar. 30, 1976	Nov. 2, 1976	B 417,164	4,001,360	Mar. 2, 1976	Jan. 4, 1977
B 358,427	3,989,896	Feb. 3, 1976	Nov. 2, 1976	B 417,349	3,985,076	Mar. 9, 1976	Oct. 12, 1976
B 359,901	3,981,729	Jan. 13, 1976	Sep. 21, 1976	B 418,489	3,989,592	Jan. 13, 1976	Nov. 2, 1976
B 363,565	4,004,821	Mar. 30, 1976	Jan. 25, 1977	B 419,173	3,999,728	Mar. 9, 1976	Dec. 28, 1976
B 364,797	3,996,131	Feb. 17, 1976	Dec. 7, 1976	B 419,582	3,989,681	Mar. 2, 1976	Nov. 2, 1976
B 367,305	3,998,640	Mar. 2, 1976	Dec. 21, 1976	B 420,176	4,001,017	Mar. 16, 1976	Jan. 4, 1977
B 367,621	3,989,589	Feb. 3, 1976	Nov. 2, 1976	B 420,321	3,990,645	Mar. 30, 1976	Nov. 9, 1976
B 369,221	3,985,834	Feb. 24, 1976	Oct. 12, 1976	B 420,472	3,993,934	Feb. 24, 1976	Nov. 23, 1976
B 370,309	3,989,640	Jan. 20, 1976	Nov. 2, 1976	B 421,373	4,001,326	Mar. 23, 1976	Jan. 4, 1977
B 371,095	4,005,074	Mar. 23, 1976	Jan. 25, 1977	B 421,975	3,994,693	Mar. 2, 1976	Nov. 30, 1976
B 371,912	3,995,738	Mar. 2, 1976	Dec. 7, 1976	B 422,063	3,994,835	Feb. 3, 1976	Nov. 30, 1976
B 372,016	3,989,685	Mar. 9, 1976	Nov. 2, 1976	B 423,365	3,996,186	Feb. 17, 1976	Dec. 7, 1976
B 372,232	4,000,967	Mar. 16, 1976	Jan. 4, 1977	B 423,404	3,990,958	Mar. 2, 1976	Nov. 9, 1976
B 372,722	3,998,925	Mar. 9, 1976	Dec. 21, 1976	B 423,441	3,997,137	Feb. 17, 1976	Dec. 14, 1976
B 373,354	3,989,870	Jan. 27, 1976	Nov. 2, 1976	B 423,867	3,990,844	Feb. 3, 1976	Nov. 9, 1976
B 374,588	3,985,899	Jan. 27, 1976	Oct. 12, 1976	B 423,883	3,986,871	Jan. 27, 1976	Oct. 19, 1976
B 378,513	3,981,750	Jan. 27, 1976	Sep. 21, 1976	B 424,354	D 242,416	Feb. 10, 1976	Nov. 23, 1976
B 378,760	4,001,477	Mar. 9, 1976	Jan. 4, 1977	B 424,989	3,990,569	Feb. 3, 1976	Nov. 9, 1976
B 379,177	3,981,976	Jan. 27, 1976	Sep. 21, 1976	B 425,193	4,002,107	Mar. 23, 1976	Jan. 11, 1977
B 381,709	3,984,587	Jan. 13, 1976	Oct. 5, 1976	B 425,462	3,998,396	Mar. 9, 1976	Dec. 21, 1976
B 381,985	3,990,775	Feb. 3, 1976	Nov. 9, 1976	B 425,588	3,985,111	Jan. 13, 1976	Oct. 12, 1976
B 384,225	3,998,523	Mar. 16, 1976	Dec. 21, 1976	B 426,227	3,999,028	Mar. 2, 1976	Dec. 21, 1976
B 384,330	3,985,613	Jan. 27, 1976	Oct. 12, 1976	B 426,266	3,998,839	Mar. 2, 1976	Dec. 21, 1976
B 384,654	3,992,681	Feb. 24, 1976	Nov. 16, 1976	B 426,424	3,993,742	Feb. 3, 1976	Nov. 23, 1976
B 385,024	3,994,911	Feb. 10, 1976	Nov. 30, 1976	B 426,639	3,992,539	Feb. 3, 1976	Nov. 16, 1976
B 385,483	3,993,684	Feb. 17, 1976	Nov. 23, 1976	B 426,819	3,995,868	Feb. 17, 1976	Dec. 7, 1976
B 385,631	3,982,924	Jan. 27, 1976	Sep. 28, 1976	B 427,883	3,982,277	Jan. 20, 1976	Sep. 21, 1976
B 386,257	3,981,915	Feb. 3, 1976	Sep. 21, 1976	B 427,946	4,006,161	Mar. 23, 1976	Feb. 1, 1977
B 386,673	3,993,717	Feb. 3, 1976	Nov. 23, 1976	B 428,103	4,000,211	Feb. 10, 1976	Dec. 28, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 428,271	3,987,415	Mar. 23, 1976	Oct. 19, 1976	B 453,432	4,000,514	Mar. 16, 1976	Dec. 28, 1976
B 428,408	3,995,252	Mar. 2, 1976	Nov. 30, 1976	B 453,533	3,997,744	Feb. 17, 1976	Dec. 14, 1976
B 428,877	3,984,649	Jan. 27, 1976	Oct. 5, 1976	B 453,616	3,987,376	Jan. 27, 1976	Oct. 19, 1976
B 429,018	3,990,061	Feb. 10, 1976	Nov. 2, 1976	B 453,759	3,989,790	Jan. 27, 1976	Nov. 2, 1976
B 429,027	4,001,260	Mar. 23, 1976	Jan. 4, 1977	B 454,283	3,995,153	Feb. 3, 1976	Nov. 30, 1976
B 429,157	3,990,628	Jan. 27, 1976	Nov. 9, 1976	B 455,425	3,990,060	Feb. 3, 1976	Nov. 2, 1976
B 429,434	3,989,223	Feb. 17, 1976	Nov. 2, 1976	B 455,481	3,991,092	Feb. 24, 1976	Nov. 9, 1976
B 430,157	3,992,465	Feb. 17, 1976	Nov. 16, 1976	B 455,486	4,001,353	Mar. 16, 1976	Jan. 4, 1977
B 430,172	3,982,563	Jan. 13, 1976	Sep. 28, 1976	B 455,686	4,001,156	Mar. 2, 1976	Jan. 4, 1977
B 430,276	3,982,171	Jan. 20, 1976	Sep. 21, 1976	B 455,759	3,984,242	Feb. 24, 1976	Oct. 5, 1976
B 430,287	D 242,489	Feb. 10, 1976	Nov. 23, 1976	B 455,806	3,998,919	Mar. 23, 1976	Dec. 21, 1976
B 430,326	4,003,581	Mar. 23, 1976	Jan. 18, 1977	B 456,069	3,998,991	Mar. 9, 1976	Dec. 21, 1976
B 430,334	3,981,677	Jan. 27, 1976	Sep. 21, 1976	B 456,148	3,984,269	Jan. 13, 1976	Oct. 5, 1976
B 431,072	3,985,610	Jan. 20, 1976	Oct. 12, 1976	B 456,153	3,997,992	Mar. 9, 1976	Dec. 21, 1976
B 431,334	3,988,095	Mar. 16, 1976	Oct. 26, 1976	B 456,579	3,993,715	Feb. 10, 1976	Nov. 23, 1976
B 431,713	4,000,167	Feb. 10, 1976	Dec. 28, 1976	B 456,869	4,001,277	Mar. 9, 1976	Jan. 4, 1977
B 431,785	3,999,950	Feb. 24, 1976	Dec. 28, 1976	B 456,900	3,996,262	Feb. 3, 1976	Dec. 7, 1976
B 431,797	4,007,290	Mar. 30, 1976	Feb. 8, 1977	B 457,547	3,996,397	Feb. 17, 1976	Dec. 7, 1976
B 432,049	3,995,123	Mar. 23, 1976	Nov. 30, 1976	B 457,850	3,993,586	Feb. 10, 1976	Nov. 23, 1976
B 432,140	3,999,163	Mar. 23, 1976	Dec. 21, 1976	B 457,862	3,987,195	Jan. 27, 1976	Oct. 19, 1976
B 432,594	4,003,404	Mar. 30, 1976	Jan. 18, 1977	B 457,886	3,988,498	Jan. 13, 1976	Oct. 26, 1976
B 432,969	3,997,017	Mar. 2, 1976	Dec. 14, 1976	B 457,931	4,001,229	Mar. 16, 1976	Jan. 4, 1977
B 432,991	3,991,669	Mar. 2, 1976	Nov. 16, 1976	B 458,500	3,997,805	Feb. 24, 1976	Dec. 14, 1976
B 433,094	3,987,768	Jan. 27, 1976	Oct. 26, 1976	B 458,617	3,984,422	Feb. 3, 1976	Oct. 5, 1976
B 434,206	3,994,610	Feb. 3, 1976	Nov. 30, 1976	B 458,964	3,996,615	Mar. 2, 1976	Dec. 7, 1976
B 434,441	D 242,849	Mar. 16, 1976	Dec. 28, 1976	B 459,381	4,000,017	Mar. 9, 1976	Dec. 28, 1976
B 435,481	4,000,892	Mar. 9, 1976	Jan. 4, 1977	B 459,597	3,996,711	Feb. 17, 1976	Dec. 14, 1976
B 435,570	4,000,908	Mar. 16, 1976	Jan. 4, 1977	B 459,811	3,982,173	Jan. 20, 1976	Sep. 21, 1976
B 435,617	4,001,234	Mar. 16, 1976	Jan. 4, 1977	B 459,821	4,005,954	Mar. 30, 1976	Feb. 1, 1977
B 436,724	3,991,856	Feb. 24, 1976	Nov. 16, 1976	B 460,388	3,989,448	Jan. 27, 1976	Nov. 2, 1976
B 437,209	4,001,193	Feb. 3, 1976	Jan. 4, 1977	B 460,441	3,981,828	Jan. 13, 1976	Sep. 21, 1976
B 437,559	3,993,287	Feb. 3, 1976	Nov. 23, 1976	B 460,846	3,985,817	Feb. 24, 1976	Oct. 12, 1976
B 437,596	3,985,638	Jan. 27, 1976	Oct. 12, 1976	B 461,184	3,992,482	Feb. 17, 1976	Nov. 16, 1976
B 437,894	4,001,015	Mar. 2, 1976	Jan. 4, 1977	B 461,250	4,000,768	Mar. 16, 1976	Jan. 4, 1977
B 438,048	4,001,394	Mar. 23, 1976	Jan. 4, 1977	B 461,336	3,982,231	Feb. 3, 1976	Sep. 21, 1976
B 438,484	3,992,451	Feb. 17, 1976	Nov. 16, 1976	B 461,352	3,981,681	Jan. 13, 1976	Sep. 21, 1976
B 438,882	3,983,719	Feb. 24, 1976	Oct. 5, 1976	B 461,874	3,982,276	Jan. 27, 1976	Sep. 21, 1976
B 438,916	3,983,050	Jan. 13, 1976	Sep. 28, 1976	B 462,386	3,988,188	Jan. 13, 1976	Oct. 26, 1976
B 439,542	3,982,199	Jan. 27, 1976	Sep. 21, 1976	B 462,424	3,989,602	Feb. 24, 1976	Nov. 2, 1976
B 439,778	4,001,455	Feb. 3, 1976	Jan. 4, 1977	B 462,828	3,998,395	Mar. 9, 1976	Dec. 21, 1976
B 440,548	4,001,271	Mar. 16, 1976	Jan. 4, 1977	B 462,893	3,984,253	Feb. 24, 1976	Oct. 5, 1976
B 440,633	4,000,116	Feb. 10, 1976	Dec. 28, 1976	B 463,322	3,989,982	Jan. 20, 1976	Nov. 2, 1976
B 440,858	3,993,670	Feb. 3, 1976	Nov. 23, 1976	B 463,388	3,992,605	Feb. 10, 1976	Nov. 16, 1976
B 441,723	3,988,249	Mar. 16, 1976	Oct. 26, 1976	B 463,473	4,002,068	Mar. 23, 1976	Jan. 11, 1977
B 441,789	4,001,449	Mar. 30, 1976	Jan. 4, 1977	B 463,671	3,985,385	Jan. 13, 1976	Oct. 12, 1976
B 442,163	D 242,192	Mar. 16, 1976	Nov. 9, 1976	B 464,027	3,999,390	Mar. 16, 1976	Dec. 28, 1976
B 442,295	4,000,477	Mar. 16, 1976	Dec. 28, 1976	B 464,290	3,990,307	Feb. 3, 1976	Nov. 9, 1976
B 442,810	3,997,533	Feb. 24, 1976	Dec. 14, 1976	B 464,587	3,991,091	Feb. 3, 1976	Nov. 9, 1976
B 442,866	3,982,351	Feb. 24, 1976	Sep. 28, 1976	B 464,593	3,997,659	Mar. 9, 1976	Dec. 14, 1976
B 442,953	4,002,657	Mar. 23, 1976	Jan. 11, 1977	B 465,145	3,981,148	Jan. 27, 1976	Sep. 21, 1976
B 442,970	3,989,890	Feb. 3, 1976	Nov. 2, 1976	B 465,202	3,989,757	Feb. 24, 1976	Nov. 2, 1976
B 443,163	3,981,242	Feb. 3, 1976	Sep. 21, 1976	B 465,393	3,987,390	Jan. 27, 1976	Oct. 19, 1976
B 443,446	D 242,494	Apr. 6, 1976	Nov. 23, 1976	B 465,688	3,989,770	Jan. 27, 1976	Nov. 2, 1976
B 443,563	3,996,204	Feb. 24, 1976	Dec. 7, 1976	B 465,955	3,997,502	Feb. 3, 1976	Dec. 14, 1976
B 443,647	3,990,737	Feb. 17, 1976	Nov. 9, 1976	B 466,304	4,007,095	Mar. 23, 1976	Feb. 8, 1977
B 443,712	3,982,233	Jan. 27, 1976	Sep. 21, 1976	B 466,318	3,999,115	Mar. 9, 1976	Dec. 21, 1976
B 444,437	3,995,171	Mar. 9, 1976	Nov. 30, 1976	B 466,390	3,983,349	Feb. 24, 1976	Sep. 28, 1976
B 445,166	4,001,252	Mar. 2, 1976	Jan. 4, 1977	B 466,444	3,986,039	Jan. 20, 1976	Oct. 12, 1976
B 445,459	3,988,889	Feb. 3, 1976	Nov. 2, 1976	B 466,906	3,993,037	Mar. 16, 1976	Nov. 23, 1976
B 445,493	3,994,903	Mar. 2, 1976	Nov. 30, 1976	B 466,929	3,991,195	Jan. 27, 1976	Nov. 9, 1976
B 445,690	3,999,584	Feb. 3, 1976	Dec. 28, 1976	B 467,250	3,997,428	Feb. 3, 1976	Dec. 14, 1976
B 446,107	4,001,276	Mar. 9, 1976	Jan. 4, 1977	B 467,328	3,997,599	Mar. 9, 1976	Dec. 14, 1976
B 447,000	3,984,419	Feb. 3, 1976	Oct. 5, 1976	B 467,412	3,981,265	Jan. 13, 1976	Sep. 21, 1976
B 447,440	3,991,724	Feb. 17, 1976	Nov. 16, 1976	B 467,486	3,991,725	Mar. 16, 1976	Nov. 16, 1976
B 449,892	3,997,919	Mar. 23, 1976	Dec. 14, 1976	B 467,971	3,983,453	Jan. 13, 1976	Sep. 28, 1976
B 450,196	3,997,701	Feb. 10, 1976	Dec. 14, 1976	B 468,052	3,988,335	Feb. 10, 1976	Oct. 26, 1976
B 450,413	4,007,463	Mar. 23, 1976	Feb. 8, 1977	B 468,100	3,995,107	Mar. 9, 1976	Nov. 30, 1976
B 450,521	3,982,838	Feb. 17, 1976	Sep. 28, 1976	B 468,330	4,001,475	Mar. 16, 1976	Jan. 4, 1977
B 450,701	3,991,084	Mar. 16, 1976	Nov. 9, 1976	B 468,350	3,981,922	Jan. 13, 1976	Sep. 21, 1976
B 450,708	3,989,724	Mar. 9, 1976	Nov. 2, 1976	B 468,603	4,003,839	Mar. 23, 1976	Jan. 18, 1977
B 450,870	3,998,951	Mar. 16, 1976	Dec. 21, 1976	B 469,036	4,005,926	Mar. 16, 1976	Feb. 1, 1977
B 450,967	3,983,055	Jan. 13, 1976	Sep. 28, 1976	B 469,468	4,000,220	Mar. 16, 1976	Dec. 28, 1976
B 451,248	3,997,758	Mar. 2, 1976	Dec. 14, 1976	B 469,947	3,984,153	Jan. 20, 1976	Oct. 5, 1976
B 451,308	3,991,037	Feb. 17, 1976	Nov. 9, 1976	B 470,170	3,986,410	Jan. 13, 1976	Oct. 19, 1976
B 451,396	4,000,450	Apr. 13, 1976	Dec. 28, 1976	B 470,348	3,981,929	Jan. 13, 1976	Sep. 21, 1976
B 451,438	Re. 29,066	Mar. 2, 1976	Dec. 7, 1976	B 470,576	3,997,507	Feb. 24, 1976	Dec. 14, 1976
B 451,534	3,986,033	Jan. 13, 1976	Oct. 12, 1976	B 470,601	3,985,655	Mar. 9, 1976	Oct. 12, 1976
B 452,034	4,002,367	Mar. 23, 1976	Jan. 11, 1977	B 470,798	3,987,480	Jan. 20, 1976	Oct. 19, 1976
B 452,138	4,004,278	Mar. 23, 1976	Jan. 18, 1977	B 470,853	4,002,101	Mar. 23, 1976	Jan. 11, 1977
B 452,501	4,001,111	Mar. 16, 1976	Jan. 4, 1977	B 470,899	3,996,441	Mar. 2, 1976	Dec. 7, 1976
B 452,672	3,981,602	Jan. 13, 1976	Sep. 21, 1976	B 470,900	4,001,213	Mar. 2, 1976	Jan. 4, 1977
B 452,879	4,001,089	Mar. 16, 1976	Jan. 4, 1977	B 471,116	4,001,318	Feb. 17, 1976	Jan. 4, 1977
B 452,883	3,981,735	Jan. 27, 1976	Sep. 21, 1976	B 471,221	3,981,974	Jan. 13, 1976	Sep. 21, 1976
B 452,938	3,994,719	Feb. 17, 1976	Nov. 30, 1976	B 471,405	3,993,576	Feb. 10, 1976	Nov. 23, 1976
B 453,031	3,998,678	Mar. 16, 1976	Dec. 21, 1976	B 471,494	3,993,660	Mar. 16, 1976	Nov. 23, 1976
B 453,067	4,005,394	Mar. 23, 1976	Jan. 25, 1977	B 471,579	3,985,689	Jan. 13, 1976	Oct. 12, 1976
B 453,238	3,997,063	Mar. 2, 1976	Dec. 14, 1976	B 471,617	3,994,871	Feb. 10, 1976	Nov. 30, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 471,735	3,989,408	Feb. 3, 1976	Nov. 2, 1976	B 487,427	3,995,788	Mar. 2, 1976	Dec. 7, 1976
B 471,836	4,000,150	Feb. 24, 1976	Dec. 28, 1976	B 488,111	3,985,765	Jan. 13, 1976	Oct. 12, 1976
B 472,241	3,992,453	Feb. 17, 1976	Nov. 16, 1976	B 488,395	3,982,245	Jan. 27, 1976	Sep. 21, 1976
B 472,256	3,985,789	Jan. 13, 1976	Oct. 12, 1976	B 488,634	3,982,158	Jan. 20, 1976	Sep. 21, 1976
B 472,284	3,982,078	Jan. 13, 1976	Sep. 21, 1976	B 488,756	3,991,810	Mar. 16, 1976	Nov. 16, 1976
B 472,760	4,001,330	Apr. 13, 1976	Jan. 4, 1977	B 489,290	3,998,081	Feb. 17, 1976	Dec. 21, 1976
B 473,039	3,985,747	Feb. 10, 1976	Oct. 12, 1976	B 489,328	3,990,088	Jan. 20, 1976	Nov. 2, 1976
B 473,040	3,985,738	Feb. 10, 1976	Oct. 12, 1976	B 489,331	3,996,175	Feb. 17, 1976	Dec. 7, 1976
B 473,813	3,989,071	Mar. 9, 1976	Nov. 2, 1976	B 489,485	D 243,266	Apr. 13, 1976	Feb. 1, 1977
B 473,972	3,984,043	Jan. 13, 1976	Oct. 5, 1976	B 489,550	4,000,710	Mar. 16, 1976	Jan. 4, 1977
B 474,573	3,988,375	Jan. 20, 1976	Oct. 26, 1976	B 489,685	3,984,085	Feb. 24, 1976	Oct. 5, 1976
B 474,747	3,997,704	Feb. 24, 1976	Dec. 14, 1976	B 490,067	3,986,600	Jan. 27, 1976	Oct. 19, 1976
B 475,236	3,989,990	Feb. 3, 1976	Nov. 2, 1976	B 490,547	3,999,439	Feb. 24, 1976	Dec. 28, 1976
B 475,385	4,001,071	Mar. 9, 1976	Jan. 4, 1977	B 490,551	D 243,168	Apr. 6, 1976	Jan. 25, 1977
B 475,681	3,983,332	Jan. 20, 1976	Sep. 28, 1976	B 490,589	3,990,680	Feb. 3, 1976	Nov. 9, 1976
B 476,267	4,005,068	Apr. 6, 1976	Jan. 25, 1977	B 490,623	3,996,964	Mar. 2, 1976	Dec. 14, 1976
B 476,372	3,985,771	Feb. 24, 1976	Oct. 12, 1976	B 490,647	3,985,196	Feb. 24, 1976	Oct. 12, 1976
B 476,568	3,999,456	Mar. 16, 1976	Dec. 28, 1976	B 490,806	3,989,486	Feb. 3, 1976	Nov. 2, 1976
B 476,577	3,982,070	Jan. 20, 1976	Sep. 21, 1976	B 490,812	3,998,842	Mar. 30, 1976	Dec. 21, 1976
B 476,681	3,986,181	Jan. 13, 1976	Oct. 12, 1976	B 490,946	3,993,652	Feb. 17, 1976	Nov. 23, 1976
B 476,776	3,998,715	Mar. 23, 1976	Dec. 21, 1976	B 490,995	3,995,031	Feb. 3, 1976	Nov. 30, 1976
B 476,967	3,995,206	Mar. 9, 1976	Nov. 30, 1976	B 491,032	3,981,892	Feb. 10, 1976	Sep. 21, 1976
B 477,252	3,985,759	Jan. 13, 1976	Oct. 12, 1976	B 491,052	3,985,790	Mar. 2, 1976	Oct. 12, 1976
B 477,481	3,991,076	Feb. 3, 1976	Nov. 9, 1976	B 491,111	3,997,916	Feb. 17, 1976	Dec. 14, 1976
B 477,584	D 242,855	Apr. 6, 1976	Dec. 28, 1976	B 491,455	3,991,167	Feb. 3, 1976	Nov. 9, 1976
B 477,597	3,993,912	Feb. 17, 1976	Nov. 23, 1976	B 491,501	3,984,914	Jan. 13, 1976	Oct. 12, 1976
B 478,739	3,992,253	Feb. 17, 1976	Nov. 16, 1976	B 491,650	3,999,044	Mar. 9, 1976	Dec. 21, 1976
B 479,175	3,985,700	Feb. 17, 1976	Oct. 12, 1976	B 491,673	3,994,770	Feb. 17, 1976	Nov. 30, 1976
B 479,242	3,983,074	Feb. 17, 1976	Sep. 28, 1976	B 491,776	3,986,298	Mar. 16, 1976	Oct. 19, 1976
B 479,502	3,999,030	Mar. 16, 1976	Dec. 21, 1976	B 491,883	3,984,412	Feb. 3, 1976	Oct. 5, 1976
B 479,681	D 242,672	Mar. 16, 1976	Dec. 14, 1976	B 491,906	D 242,223	Feb. 10, 1976	Nov. 9, 1976
B 479,969	4,001,132	Mar. 9, 1976	Jan. 4, 1977	B 492,039	3,997,541	Feb. 24, 1976	Dec. 14, 1976
B 480,114	4,001,327	Mar. 2, 1976	Jan. 4, 1977	B 492,093	4,003,658	Mar. 23, 1976	Jan. 18, 1977
B 480,287	4,006,029	Mar. 30, 1976	Feb. 1, 1977	B 492,120	3,995,692	Feb. 24, 1976	Dec. 7, 1976
B 480,292	3,994,011	Mar. 16, 1976	Nov. 23, 1976	B 492,301	3,981,073	Jan. 13, 1976	Sep. 21, 1976
B 480,350	3,994,164	Feb. 10, 1976	Nov. 30, 1976	B 492,688	3,983,415	Jan. 20, 1976	Sep. 28, 1976
B 480,384	3,999,737	Mar. 23, 1976	Dec. 28, 1976	B 492,716	3,998,739	Mar. 2, 1976	Dec. 21, 1976
B 480,452	3,994,923	Feb. 10, 1976	Nov. 30, 1976	B 492,774	4,001,843	Mar. 9, 1976	Jan. 4, 1977
B 480,473	3,995,608	Mar. 2, 1976	Dec. 7, 1976	B 492,902	3,993,859	Feb. 24, 1976	Nov. 23, 1976
B 480,604	3,985,251	Jan. 13, 1976	Oct. 12, 1976	B 492,946	3,991,303	Jan. 27, 1976	Nov. 9, 1976
B 480,625	3,996,227	Feb. 24, 1976	Dec. 7, 1976	B 493,254	D 243,267	Apr. 13, 1976	Feb. 1, 1977
B 480,662	3,988,382	Mar. 2, 1976	Oct. 26, 1976	B 493,370	3,984,792	Mar. 16, 1976	Oct. 5, 1976
B 480,740	3,996,431	Mar. 2, 1976	Dec. 7, 1976	B 493,501	3,988,061	Feb. 3, 1976	Oct. 26, 1976
B 480,749	3,999,207	Mar. 9, 1976	Dec. 21, 1976	B 493,955	3,989,830	Mar. 9, 1976	Nov. 2, 1976
B 480,987	4,001,459	Mar. 30, 1976	Jan. 4, 1977	B 493,981	3,990,165	Mar. 9, 1976	Nov. 9, 1976
B 481,048	3,998,542	Mar. 16, 1976	Dec. 21, 1976	B 494,234	3,983,808	Feb. 10, 1976	Oct. 5, 1976
B 481,600	3,981,235	Jan. 27, 1976	Sep. 21, 1976	B 494,339	4,001,255	Mar. 16, 1976	Jan. 4, 1977
B 481,737	3,982,057	Jan. 13, 1976	Sep. 21, 1976	B 494,383	3,991,289	Feb. 3, 1976	Nov. 9, 1976
B 481,778	4,001,385	Mar. 30, 1976	Jan. 4, 1977	B 494,669	3,991,104	Feb. 3, 1976	Nov. 9, 1976
B 481,930	3,992,717	Feb. 24, 1976	Nov. 16, 1976	B 494,691	3,987,457	Mar. 16, 1976	Oct. 19, 1976
B 482,058	4,001,398	Mar. 2, 1976	Jan. 4, 1977	B 494,806	3,989,210	Feb. 3, 1976	Nov. 2, 1976
B 482,660	3,995,026	Feb. 10, 1976	Nov. 30, 1976	B 494,944	3,992,469	Feb. 17, 1976	Nov. 16, 1976
B 482,709	3,985,733	Feb. 24, 1976	Oct. 12, 1976	B 495,185	3,999,166	Mar. 9, 1976	Dec. 21, 1976
B 482,907	3,984,811	Jan. 20, 1976	Oct. 5, 1976	B 495,331	4,000,456	Mar. 16, 1976	Dec. 28, 1976
B 483,247	4,001,889	Apr. 13, 1976	Jan. 4, 1977	B 495,402	3,983,988	Feb. 17, 1976	Oct. 5, 1976
B 483,256	3,981,723	Feb. 10, 1976	Sep. 21, 1976	B 495,408	4,000,222	Feb. 3, 1976	Dec. 28, 1976
B 483,268	3,995,215	Mar. 9, 1976	Nov. 30, 1976	B 495,489	3,984,571	Feb. 3, 1976	Oct. 5, 1976
B 483,606	3,986,990	Jan. 27, 1976	Oct. 19, 1976	B 495,550	3,993,666	Feb. 3, 1976	Nov. 23, 1976
B 483,615	3,988,637	Jan. 27, 1976	Oct. 26, 1976	B 495,554	3,993,665	Feb. 3, 1976	Nov. 23, 1976
B 483,762	3,993,608	Feb. 10, 1976	Nov. 23, 1976	B 495,759	3,989,998	Feb. 3, 1976	Nov. 2, 1976
B 483,865	3,985,693	Jan. 13, 1976	Oct. 12, 1976	B 495,903	3,995,997	Feb. 17, 1976	Dec. 7, 1976
B 484,029	3,983,558	Feb. 10, 1976	Sep. 28, 1976	B 496,430	3,991,140	Feb. 10, 1976	Nov. 9, 1976
B 484,067	3,992,374	Feb. 17, 1976	Nov. 16, 1976	B 496,431	3,985,894	Jan. 13, 1976	Oct. 12, 1976
B 484,068	3,994,937	Mar. 2, 1976	Nov. 30, 1976	B 496,487	3,982,261	Jan. 20, 1976	Sep. 21, 1976
B 484,121	3,997,770	Mar. 16, 1976	Dec. 14, 1976	B 496,500	3,985,962	Feb. 3, 1976	Oct. 12, 1976
B 484,269	4,000,159	Feb. 10, 1976	Dec. 28, 1976	B 496,502	3,987,444	Jan. 20, 1976	Oct. 19, 1976
B 484,332	3,986,540	Mar. 2, 1976	Oct. 19, 1976	B 496,792	3,999,959	Feb. 17, 1976	Dec. 28, 1976
B 484,365	3,983,578	Jan. 27, 1976	Sep. 28, 1976	B 496,964	3,999,219	Apr. 20, 1976	Dec. 21, 1976
B 484,419	4,001,292	Mar. 9, 1976	Jan. 4, 1977	B 496,999	3,983,804	Jan. 27, 1976	Oct. 5, 1976
B 484,482	3,994,017	Mar. 23, 1976	Nov. 23, 1976	B 497,021	3,985,039	Jan. 13, 1976	Oct. 12, 1976
B 484,769	3,999,498	Mar. 16, 1976	Dec. 28, 1976	B 497,194	3,988,267	Feb. 3, 1976	Oct. 26, 1976
B 485,051	3,992,418	Feb. 17, 1976	Nov. 16, 1976	B 497,292	3,994,052	Feb. 3, 1976	Nov. 30, 1976
B 485,060	3,983,067	Feb. 17, 1976	Sep. 28, 1976	B 497,473	3,990,839	Feb. 3, 1976	Nov. 9, 1976
B 485,169	3,989,791	Mar. 16, 1976	Nov. 2, 1976	B 497,584	3,988,184	Feb. 24, 1976	Oct. 26, 1976
B 485,188	4,001,170	Mar. 16, 1976	Jan. 4, 1977	B 497,702	3,996,589	Mar. 2, 1976	Dec. 7, 1976
B 485,401	3,985,859	Jan. 27, 1976	Oct. 12, 1976	B 497,780	3,997,500	Feb. 24, 1976	Dec. 14, 1976
B 485,575	3,996,565	Feb. 24, 1976	Dec. 7, 1976	B 497,853	3,987,934	Feb. 17, 1976	Oct. 26, 1976
B 485,926	4,006,357	Mar. 23, 1976	Feb. 1, 1977	B 497,896	D 243,091	Apr. 6, 1976	Jan. 18, 1977
B 486,280	3,983,130	Feb. 3, 1976	Sep. 28, 1976	B 497,960	3,991,325	Jan. 20, 1976	Nov. 9, 1976
B 486,614	3,995,835	Feb. 17, 1976	Dec. 7, 1976	B 498,208	4,001,480	Apr. 13, 1976	Jan. 4, 1977
B 486,678	4,001,273	Mar. 2, 1976	Jan. 4, 1977	B 498,775	3,993,868	Mar. 2, 1976	Nov. 23, 1976
B 486,828	3,989,651	Mar. 2, 1976	Nov. 2, 1976	B 498,205	3,989,611	Feb. 10, 1976	Nov. 2, 1976
B 487,062	D 241,256	Feb. 10, 1976	Nov. 9, 1976	B 498,500	3,982,241	Jan. 20, 1976	Sep. 21, 1976
B 487,133	3,989,826	Jan. 27, 1976	Nov. 2, 1976	B 498,775	3,993,868	Mar. 2, 1976	Nov. 23, 1976
B 487,260	3,990,610	Jan. 27, 1976	Nov. 9, 1976	B 498,820	3,996,670	Mar. 9, 1976	Dec. 14, 1976
B 487,411	3,983,579	Feb. 24, 1976	Sep. 28, 1976	B 498,951	3,996,907	Mar. 2, 1976	Dec. 14, 1976
B 487,423	3,998,810	Mar. 2, 1976	Dec. 21, 1976	B 499,171	3,985,192	Jan. 27, 1976	Oct. 12, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 499,209	3,995,907	Feb. 24, 1976	Dec. 7, 1976	B 509,586	4,006,645	Feb. 3, 1976	Feb. 8, 1977
B 499,227	3,981,344	Jan. 27, 1976	Sep. 21, 1976	B 509,606	3,989,986	Feb. 3, 1976	Nov. 2, 1976
B 499,324	4,001,375	Mar. 16, 1976	Jan. 4, 1977	B 509,772	3,999,004	Mar. 16, 1976	Dec. 21, 1976
B 499,352	3,981,391	Jan. 27, 1976	Sep. 21, 1976	B 510,184	D 242,784	Apr. 6, 1976	Dec. 21, 1976
B 499,718	3,990,058	Jan. 27, 1976	Nov. 2, 1976	B 510,281	3,993,215	Mar. 9, 1976	Nov. 23, 1976
B 499,786	4,000,663	Mar. 16, 1976	Jan. 4, 1977	B 510,346	D 242,207	Feb. 10, 1976	Nov. 9, 1976
B 500,171	3,997,262	Mar. 30, 1976	Dec. 14, 1976	B 510,458	4,000,221	Feb. 10, 1976	Dec. 28, 1976
B 500,176	3,995,316	Feb. 3, 1976	Nov. 30, 1976	B 510,521	3,990,656	Mar. 2, 1976	Nov. 9, 1976
B 500,408	D 242,721	Mar. 16, 1976	Dec. 14, 1976	B 510,588	3,981,539	Jan. 27, 1976	Sep. 21, 1976
B 500,945	3,996,817	Feb. 24, 1976	Dec. 14, 1976	B 510,677	3,989,541	Feb. 24, 1976	Nov. 2, 1976
B 500,981	3,984,681	Jan. 27, 1976	Oct. 5, 1976	B 510,682	4,000,978	Mar. 30, 1976	Jan. 4, 1977
B 501,122	3,981,385	Feb. 17, 1976	Sep. 21, 1976	B 510,850	3,989,841	Feb. 3, 1976	Nov. 2, 1976
B 501,181	3,984,761	Feb. 10, 1976	Oct. 5, 1976	B 510,855	3,981,059	Jan. 27, 1976	Sep. 21, 1976
B 501,253	3,994,015	Feb. 3, 1976	Nov. 23, 1976	B 511,907	3,999,622	Mar. 30, 1976	Dec. 28, 1976
B 501,317	3,985,643	Jan. 13, 1976	Oct. 12, 1976	B 510,998	3,992,336	Feb. 10, 1976	Nov. 16, 1976
B 501,415	3,982,051	Jan. 13, 1976	Sep. 21, 1976	B 511,002	3,998,717	Mar. 2, 1976	Dec. 21, 1976
B 501,503	4,001,640	Mar. 2, 1976	Jan. 4, 1977	B 511,099	3,990,162	Feb. 3, 1976	Nov. 9, 1976
B 501,540	3,985,694	Jan. 13, 1976	Oct. 12, 1976	B 511,156	3,981,364	Jan. 27, 1976	Sep. 21, 1976
B 501,975	3,998,466	Mar. 2, 1976	Dec. 21, 1976	B 511,346	3,984,072	Jan. 27, 1976	Oct. 5, 1976
B 501,993	3,981,606	Jan. 13, 1976	Sep. 21, 1976	B 511,407	3,981,485	Feb. 10, 1976	Sep. 21, 1976
B 502,151	3,998,614	Mar. 23, 1976	Dec. 21, 1976	B 511,454	3,982,333	Feb. 24, 1976	Sep. 28, 1976
B 502,161	4,000,500	Mar. 2, 1976	Dec. 28, 1976	B 511,665	4,001,037	Mar. 2, 1976	Jan. 4, 1977
B 502,289	3,982,274	Jan. 13, 1976	Sep. 21, 1976	B 511,885	3,981,346	Jan. 27, 1976	Sep. 21, 1976
B 502,381	D 242,231	Mar. 16, 1976	Nov. 9, 1976	B 511,886	3,989,991	Feb. 3, 1976	Nov. 2, 1976
B 502,540	3,983,698	Jan. 13, 1976	Oct. 5, 1976	B 511,909	3,981,183	Feb. 17, 1976	Sep. 21, 1976
B 502,571	D 242,433	Apr. 6, 1976	Nov. 23, 1976	B 512,324	3,985,084	Feb. 17, 1976	Oct. 12, 1976
B 502,589	3,989,652	Jan. 27, 1976	Nov. 2, 1976	B 512,547	3,984,193	Jan. 13, 1976	Oct. 5, 1976
B 502,652	3,989,186	Feb. 24, 1976	Nov. 2, 1976	B 512,745	3,981,294	Jan. 13, 1976	Sep. 21, 1976
B 502,667	3,991,431	Feb. 24, 1976	Nov. 16, 1976	B 512,818	3,997,363	Apr. 6, 1976	Dec. 14, 1976
B 502,973	3,982,161	Jan. 27, 1976	Sep. 21, 1976	B 512,849	3,982,141	Feb. 3, 1976	Sep. 21, 1976
B 502,993	3,992,489	Feb. 17, 1976	Nov. 16, 1976	B 512,964	3,995,279	Feb. 10, 1976	Nov. 30, 1976
B 503,029	3,986,879	Jan. 27, 1976	Oct. 19, 1976	B 513,014	3,991,113	Feb. 10, 1976	Nov. 9, 1976
B 503,345	4,001,235	Feb. 24, 1976	Jan. 4, 1977	B 513,027	3,995,143	Feb. 17, 1976	Nov. 30, 1976
B 503,436	3,988,819	Feb. 24, 1976	Nov. 2, 1976	B 513,134	4,006,764	Mar. 23, 1976	Feb. 8, 1977
B 503,521	3,999,646	Mar. 16, 1976	Dec. 28, 1976	B 513,280	3,988,211	Jan. 20, 1976	Oct. 26, 1976
B 503,579	3,989,680	Feb. 10, 1976	Nov. 2, 1976	B 513,368	3,982,138	Feb. 3, 1976	Sep. 21, 1976
B 503,618	3,997,782	Mar. 9, 1976	Dec. 14, 1976	B 513,706	3,986,064	Jan. 13, 1976	Oct. 12, 1976
B 503,742	3,989,756	Feb. 17, 1976	Nov. 2, 1976	B 513,756	3,993,869	Feb. 3, 1976	Nov. 23, 1976
B 503,780	3,990,055	Mar. 16, 1976	Nov. 2, 1976	B 513,781	4,001,324	Feb. 24, 1976	Jan. 4, 1977
B 503,817	3,988,307	Jan. 13, 1976	Oct. 26, 1976	B 513,789	3,981,599	Feb. 3, 1976	Sep. 21, 1976
B 504,056	3,993,923	Feb. 24, 1976	Nov. 23, 1976	B 514,687	3,986,522	Jan. 27, 1976	Oct. 19, 1976
B 504,061	3,987,534	Mar. 16, 1976	Oct. 26, 1976	B 515,135	3,990,085	Feb. 17, 1976	Nov. 2, 1976
B 504,156	3,999,048	Mar. 23, 1976	Dec. 21, 1976	B 515,303	3,987,939	Jan. 20, 1976	Oct. 26, 1976
B 504,169	3,981,219	Jan. 13, 1976	Sep. 21, 1976	B 515,452	3,995,243	Feb. 10, 1976	Nov. 30, 1976
B 504,404	3,996,499	Feb. 24, 1976	Dec. 7, 1976	B 515,455	3,982,149	Jan. 27, 1976	Sep. 21, 1976
B 504,405	4,007,401	Apr. 13, 1976	Feb. 8, 1977	B 515,642	4,001,258	Feb. 24, 1976	Jan. 4, 1977
B 504,439	3,999,398	Mar. 16, 1976	Dec. 28, 1976	B 515,908	3,984,676	Jan. 20, 1976	Oct. 5, 1976
B 504,503	3,999,210	Mar. 9, 1976	Dec. 21, 1976	B 516,002	3,988,638	Jan. 13, 1976	Oct. 26, 1976
B 504,582	4,005,138	Mar. 30, 1976	Jan. 25, 1977	B 516,032	3,986,634	Jan. 27, 1976	Oct. 19, 1976
B 504,778	3,986,650	Feb. 24, 1976	Oct. 19, 1976	B 516,047	3,985,741	Feb. 10, 1976	Oct. 12, 1976
B 504,877	3,997,564	Feb. 24, 1976	Dec. 14, 1976	B 516,060	3,983,572	Feb. 17, 1976	Sep. 28, 1976
B 504,899	3,991,273	Mar. 9, 1976	Nov. 9, 1976	B 516,069	3,986,208	Mar. 16, 1976	Oct. 12, 1976
B 505,126	3,981,745	Feb. 10, 1976	Sep. 21, 1976	B 516,296	3,984,404	Feb. 3, 1976	Oct. 5, 1976
B 505,582	4,001,659	Mar. 23, 1976	Jan. 4, 1977	B 516,537	3,996,784	Feb. 17, 1976	Dec. 14, 1976
B 505,689	3,987,631	Mar. 2, 1976	Oct. 26, 1976	B 516,564	3,993,931	Feb. 17, 1976	Nov. 23, 1976
B 505,813	3,985,175	Jan. 13, 1976	Oct. 12, 1976	B 516,609	3,994,486	Feb. 24, 1976	Nov. 30, 1976
B 506,144	3,991,147	Feb. 10, 1976	Nov. 9, 1976	B 516,804	3,991,209	Mar. 23, 1976	Nov. 9, 1976
B 506,148	3,988,319	Feb. 3, 1976	Oct. 26, 1976	B 516,825	3,988,885	Feb. 3, 1976	Nov. 2, 1976
B 506,167	3,990,652	Feb. 10, 1976	Nov. 9, 1976	B 517,273	D 242,798	Mar. 16, 1976	Dec. 21, 1976
B 506,286	3,982,085	Jan. 20, 1976	Sep. 21, 1976	B 517,504	3,999,855	Mar. 9, 1976	Dec. 28, 1976
B 506,461	3,987,348	Jan. 20, 1976	Oct. 19, 1976	B 517,762	3,986,065	Mar. 16, 1976	Oct. 12, 1976
B 506,566	3,985,402	Jan. 20, 1976	Oct. 12, 1976	B 517,858	4,000,999	Feb. 17, 1976	Jan. 4, 1977
B 506,624	3,999,695	Mar. 9, 1976	Dec. 28, 1976	B 517,956	D 243,088	Apr. 6, 1976	Jan. 18, 1977
B 506,648	3,994,857	Feb. 3, 1976	Nov. 30, 1976	B 517,957	D 243,089	Apr. 6, 1976	Jan. 18, 1977
B 506,744	3,981,176	Jan. 13, 1976	Sep. 21, 1976	B 518,226	3,993,509	Feb. 10, 1976	Nov. 23, 1976
B 506,839	4,005,389	Mar. 23, 1976	Jan. 25, 1977	B 518,656	3,989,732	Feb. 17, 1976	Nov. 2, 1976
B 506,840	4,002,928	Mar. 23, 1976	Jan. 11, 1977	B 518,859	3,989,971	Feb. 3, 1976	Nov. 2, 1976
B 506,916	3,986,140	Feb. 3, 1976	Oct. 12, 1976	B 518,999	3,990,323	Feb. 3, 1976	Nov. 9, 1976
B 506,926	3,993,232	Feb. 17, 1976	Nov. 23, 1976	B 519,095	3,993,621	Feb. 24, 1976	Nov. 23, 1976
B 507,087	3,991,389	Feb. 17, 1976	Nov. 9, 1976	B 519,377	3,987,223	Jan. 27, 1976	Oct. 19, 1976
B 507,131	4,000,499	Mar. 2, 1976	Dec. 28, 1976	B 519,446	3,985,815	Feb. 24, 1976	Oct. 12, 1976
B 507,396	3,995,.67	Feb. 10, 1976	Nov. 30, 1976	B 519,485	3,991,134	Feb. 10, 1976	Nov. 9, 1976
B 507,476	3,994,680	Feb. 10, 1976	Nov. 30, 1976	B 519,486	3,992,481	Feb. 17, 1976	Nov. 16, 1976
B 507,647	3,982,240	Jan. 27, 1976	Sep. 21, 1976	B 519,487	3,992,337	Feb. 17, 1976	Nov. 16, 1976
B 508,118	3,992,283	Feb. 17, 1976	Nov. 16, 1976	B 519,599	3,995,350	Feb. 17, 1976	Dec. 7, 1976
B 508,119	3,992,285	Feb. 17, 1976	Nov. 16, 1976	B 519,932	3,988,618	Feb. 3, 1976	Oct. 26, 1976
B 508,369	3,985,847	Jan. 13, 1976	Oct. 12, 1976	B 519,979	3,982,067	Feb. 3, 1976	Sep. 21, 1976
B 508,639	4,004,194	Mar. 23, 1976	Jan. 18, 1977	B 520,063	3,989,934	Mar. 2, 1976	Nov. 2, 1976
B 508,817	3,989,891	Feb. 3, 1976	Nov. 2, 1976	B 520,075	3,989,935	Feb. 24, 1976	Nov. 2, 1976
B 508,878	3,994,117	Feb. 3, 1976	Nov. 30, 1976	B 520,076	3,989,936	Mar. 2, 1976	Nov. 2, 1976
B 508,940	3,981,321	Feb. 17, 1976	Sep. 21, 1976	B 520,082	3,989,937	Mar. 23, 1976	Nov. 2, 1976
B 508,961	3,987,477	Feb. 3, 1976	Oct. 19, 1976	B 520,115	4,003,072	Mar. 23, 1976	Jan. 11, 1977
B 509,043	3,996,767	Feb. 24, 1976	Dec. 14, 1976	B 520,227	4,002,823	Mar. 30, 1976	Jan. 11, 1977
B 509,165	3,999,155	Mar. 2, 1976	Dec. 21, 1976	B 520,256	3,985,730	Jan. 13, 1976	Oct. 12, 1976
B 509,185	3,989,996	Feb. 3, 1976	Nov. 2, 1976	B 520,277	3,995,635	Feb. 17, 1976	Dec. 7, 1976
B 509,238	3,982,399	Feb. 24, 1976	Sep. 28, 1976	B 520,341	3,992,028	Mar. 16, 1976	Nov. 16, 1976
B 509,474	3,997,260	Feb. 17, 1976	Dec. 14, 1976	B 520,384	3,986,592	Jan. 27, 1976	Oct. 19, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 520,514	3,988,308	Mar. 9, 1976	Oct. 26, 1976	B 530,605	3,989,064	Feb. 3, 1976	Nov. 2, 1976
B 520,534	3,997,119	Feb. 17, 1976	Dec. 14, 1976	B 530,813	3,986,131	Feb. 17, 1976	Oct. 12, 1976
B 520,543	3,986,768	Jan. 27, 1976	Oct. 19, 1976	B 530,873	4,001,016	Feb. 17, 1976	Jan. 4, 1977
B 520,546	4,001,133	Mar. 2, 1976	Jan. 4, 1977	B 530,925	3,983,161	Feb. 24, 1976	Sep. 28, 1976
B 520,613	3,991,341	Mar. 16, 1976	Nov. 9, 1976	B 531,096	3,984,415	Feb. 10, 1976	Oct. 5, 1976
B 520,658	3,998,778	Mar. 9, 1976	Dec. 21, 1976	B 531,267	3,997,040	Feb. 24, 1976	Dec. 14, 1976
B 520,884	4,000,433	Mar. 16, 1976	Dec. 28, 1976	B 531,425	3,992,595	Feb. 3, 1976	Nov. 16, 1976
B 520,924	3,982,113	Jan. 27, 1976	Sep. 21, 1976	B 531,566	3,997,820	Mar. 16, 1976	Dec. 14, 1976
B 520,928	3,983,617	Jan. 13, 1976	Oct. 5, 1976	B 531,686	3,990,017	Mar. 23, 1976	Nov. 2, 1976
B 520,952	4,000,876	Mar. 16, 1976	Jan. 4, 1977	B 531,753	3,988,843	Mar. 2, 1976	Nov. 2, 1976
B 521,025	3,998,838	Mar. 23, 1976	Dec. 21, 1976	B 531,929	3,986,067	Jan. 20, 1976	Oct. 12, 1976
B 521,044	3,983,435	Feb. 24, 1976	Sep. 28, 1976	B 532,005	3,992,397	Feb. 24, 1976	Nov. 16, 1976
B 521,045	3,983,433	Feb. 24, 1976	Sep. 28, 1976	B 532,140	4,001,299	Mar. 2, 1976	Jan. 4, 1977
B 521,046	3,983,434	Feb. 24, 1976	Sep. 28, 1976	B 532,319	3,990,292	Feb. 3, 1976	Nov. 9, 1976
B 521,125	3,994,865	Feb. 10, 1976	Nov. 30, 1976	B 532,326	3,993,959	Mar. 23, 1976	Nov. 23, 1976
B 521,126	3,997,510	Feb. 10, 1976	Dec. 14, 1976	B 532,424	D 242,292	Feb. 10, 1976	Nov. 9, 1976
B 521,127	3,996,201	Feb. 17, 1976	Dec. 7, 1976	B 532,476	3,992,756	Feb. 3, 1976	Nov. 23, 1976
B 521,128	3,997,511	Feb. 10, 1976	Dec. 14, 1976	B 532,901	3,984,318	Jan. 13, 1976	Oct. 5, 1976
B 521,324	3,983,143	Jan. 27, 1976	Sep. 28, 1976	B 532,969	3,981,706	Jan. 13, 1976	Sep. 21, 1976
B 521,480	3,982,665	Jan. 13, 1976	Sep. 28, 1976	B 532,976	4,000,837	Mar. 23, 1976	Jan. 4, 1977
B 521,600	3,981,458	Jan. 27, 1976	Sep. 21, 1976	B 533,056	3,983,969	Jan. 13, 1976	Oct. 5, 1976
B 521,612	4,000,251	Mar. 9, 1976	Dec. 28, 1976	B 533,259	3,999,556	Feb. 24, 1976	Dec. 28, 1976
B 521,620	3,983,749	Jan. 27, 1976	Oct. 5, 1976	B 533,454	3,996,566	Mar. 2, 1976	Dec. 7, 1976
B 521,643	3,997,567	Mar. 2, 1976	Dec. 14, 1976	B 533,580	3,982,255	Feb. 3, 1976	Sep. 21, 1976
B 521,711	3,989,835	Feb. 10, 1976	Nov. 2, 1976	B 533,652	4,000,196	Mar. 23, 1976	Dec. 28, 1976
B 521,793	3,996,981	Feb. 24, 1976	Dec. 14, 1976	B 533,734	3,984,799	Jan. 27, 1976	Oct. 5, 1976
B 521,984	3,983,220	Feb. 17, 1976	Sep. 28, 1976	B 533,968	3,986,576	Jan. 27, 1976	Oct. 19, 1976
B 521,986	3,981,607	Feb. 3, 1976	Sep. 21, 1976	B 534,016	3,983,381	Feb. 3, 1976	Sep. 28, 1976
B 522,009	3,995,444	Feb. 17, 1976	Dec. 7, 1976	B 534,313	3,981,675	Jan. 27, 1976	Sep. 21, 1976
B 522,038	3,993,119	Feb. 3, 1976	Nov. 23, 1976	B 534,314	3,981,786	Feb. 10, 1976	Sep. 21, 1976
B 522,227	3,992,904	Mar. 30, 1976	Nov. 23, 1976	B 534,333	3,981,480	Feb. 17, 1976	Sep. 21, 1976
B 522,309	3,991,603	Feb. 3, 1976	Nov. 16, 1976	B 534,334	D 242,722	Mar. 16, 1976	Dec. 14, 1976
B 522,354	3,984,959	Jan. 20, 1976	Oct. 12, 1976	B 534,443	3,989,970	Jan. 27, 1976	Nov. 2, 1976
B 522,446	4,001,194	Mar. 30, 1976	Jan. 4, 1977	B 534,574	3,995,624	Feb. 24, 1976	Dec. 7, 1976
B 522,537	3,999,587	Mar. 30, 1976	Dec. 28, 1976	B 534,591	3,991,141	Feb. 17, 1976	Nov. 9, 1976
B 522,567	3,996,238	Feb. 17, 1976	Dec. 7, 1976	B 534,767	3,982,180	Feb. 3, 1976	Sep. 21, 1976
B 522,568	D 242,785	Apr. 6, 1976	Dec. 21, 1976	B 534,991	3,983,517	Jan. 27, 1976	Sep. 28, 1976
B 522,577	3,982,123	Jan. 27, 1976	Sep. 21, 1976	B 535,076	3,981,718	Jan. 20, 1976	Sep. 21, 1976
B 522,629	4,001,155	Mar. 16, 1976	Jan. 4, 1977	B 535,209	4,001,873	Mar. 16, 1976	Jan. 4, 1977
B 523,226	4,006,367	Mar. 23, 1976	Feb. 1, 1977	B 535,256	3,999,150	Mar. 23, 1976	Dec. 21, 1976
B 523,696	3,986,071	Jan. 13, 1976	Oct. 12, 1976	B 535,268	3,999,045	Mar. 30, 1976	Dec. 21, 1976
B 523,885	3,981,040	Feb. 17, 1976	Sep. 21, 1976	B 535,386	3,981,150	Jan. 13, 1976	Sep. 21, 1976
B 523,952	3,988,707	Mar. 23, 1976	Oct. 26, 1976	B 535,391	3,981,386	Jan. 27, 1976	Sep. 21, 1976
B 524,026	3,992,206	Feb. 10, 1976	Nov. 16, 1976	B 535,411	3,990,543	Feb. 24, 1976	Nov. 9, 1976
B 524,121	3,982,536	Feb. 3, 1976	Sep. 28, 1976	B 535,437	3,997,555	Feb. 24, 1976	Dec. 14, 1976
B 524,179	3,985,872	Jan. 13, 1976	Oct. 12, 1976	B 535,448	3,997,123	Mar. 16, 1976	Dec. 14, 1976
B 524,464	3,985,580	Feb. 10, 1976	Oct. 12, 1976	B 535,466	3,981,309	Jan. 27, 1976	Sep. 21, 1976
B 524,806	4,000,065	Mar. 2, 1976	Dec. 28, 1976	B 535,813	3,981,819	Jan. 27, 1976	Sep. 21, 1976
B 525,133	3,996,481	Mar. 23, 1976	Dec. 7, 1976	B 535,928	3,981,466	Jan. 13, 1976	Sep. 21, 1976
B 525,204	4,001,109	Mar. 16, 1976	Jan. 4, 1977	B 536,009	3,982,112	Jan. 27, 1976	Sep. 21, 1976
B 525,809	3,985,040	Feb. 24, 1976	Oct. 12, 1976	B 536,082	3,997,783	Mar. 16, 1976	Dec. 14, 1976
B 525,961	3,985,557	Jan. 13, 1976	Oct. 12, 1976	B 536,322	4,001,272	Mar. 23, 1976	Jan. 4, 1977
B 526,106	3,990,073	Jan. 27, 1976	Nov. 2, 1976	B 536,403	3,998,341	Mar. 23, 1976	Dec. 21, 1976
B 526,190	3,982,129	Feb. 17, 1976	Sep. 21, 1976	B 536,511	3,995,989	Mar. 9, 1976	Dec. 7, 1976
B 526,289	3,992,641	Feb. 24, 1976	Nov. 16, 1976	B 536,675	3,985,773	Jan. 20, 1976	Oct. 12, 1976
B 526,388	3,992,017	Feb. 3, 1976	Nov. 16, 1976	B 536,935	3,985,729	Jan. 13, 1976	Oct. 12, 1976
B 526,445	3,984,978	Jan. 20, 1976	Oct. 12, 1976	B 537,058	4,000,969	Mar. 23, 1976	Jan. 4, 1977
B 526,447	4,000,052	Feb. 24, 1976	Dec. 28, 1976	B 537,102	3,981,829	Jan. 13, 1976	Sep. 21, 1976
B 526,510	3,989,708	Jan. 20, 1976	Nov. 2, 1976	B 537,709	3,981,368	Jan. 13, 1976	Sep. 21, 1976
B 526,997	3,985,695	Jan. 13, 1976	Oct. 12, 1976	B 537,711	3,985,748	Jan. 13, 1976	Oct. 12, 1976
B 527,054	3,981,559	Feb. 17, 1976	Sep. 21, 1976	B 537,722	3,985,423	Feb. 3, 1976	Oct. 12, 1976
B 527,171	3,998,248	Mar. 9, 1976	Dec. 21, 1976	B 537,903	3,986,492	Jan. 20, 1976	Oct. 19, 1976
B 527,187	3,995,202	Feb. 17, 1976	Nov. 30, 1976	B 538,472	3,992,884	Feb. 3, 1976	Nov. 23, 1976
B 527,333	3,999,732	Mar. 23, 1976	Dec. 28, 1976	B 538,491	3,982,928	Feb. 17, 1976	Sep. 28, 1976
B 527,669	3,982,206	Jan. 13, 1976	Sep. 21, 1976	B 538,686	3,982,199	Jan. 13, 1976	Sep. 21, 1976
B 527,693	3,995,233	Feb. 3, 1976	Nov. 30, 1976	B 538,753	3,993,642	Feb. 10, 1976	Nov. 23, 1976
B 527,788	D 242,337	Feb. 10, 1976	Nov. 16, 1976	B 539,374	3,996,229	Mar. 9, 1976	Dec. 7, 1976
B 527,972	4,000,016	Mar. 9, 1976	Dec. 28, 1976	B 539,746	3,983,423	Feb. 17, 1976	Sep. 28, 1976
B 527,999	3,981,682	Feb. 3, 1976	Sep. 21, 1976	B 540,078	3,984,701	Jan. 13, 1976	Oct. 5, 1976
B 528,297	4,001,138	Mar. 16, 1976	Jan. 4, 1977	B 540,218	3,986,108	Feb. 10, 1976	Oct. 12, 1976
B 528,303	3,991,023	Feb. 10, 1976	Nov. 9, 1976	B 540,632	3,981,600	Jan. 13, 1976	Sep. 21, 1976
B 528,401	3,991,619	Feb. 3, 1976	Nov. 16, 1976	B 540,767	3,986,010	Mar. 16, 1976	Oct. 12, 1976
B 528,756	3,990,476	Feb. 3, 1976	Nov. 9, 1976	B 540,872	3,982,135	Jan. 20, 1976	Sep. 21, 1976
B 528,761	3,982,221	Feb. 10, 1976	Sep. 21, 1976	B 540,888	4,005,528	Mar. 30, 1976	Feb. 1, 1977
B 528,962	3,989,666	Feb. 24, 1976	Nov. 2, 1976	B 541,015	3,993,208	Jan. 27, 1976	Nov. 23, 1976
B 528,966	3,989,667	Feb. 24, 1976	Nov. 2, 1976	B 541,376	3,981,690	Feb. 17, 1976	Sep. 21, 1976
B 529,156	3,989,158	Jan. 13, 1976	Nov. 2, 1976	B 541,415	3,982,080	Feb. 3, 1976	Sep. 21, 1976
B 529,194	4,000,776	Mar. 23, 1976	Jan. 4, 1977	B 541,464	3,995,424	Feb. 17, 1976	Dec. 7, 1976
B 529,659	3,996,875	Feb. 24, 1976	Dec. 14, 1976	B 541,496	3,982,232	Jan. 27, 1976	Sep. 21, 1976
B 529,836	3,994,345	Feb. 3, 1976	Nov. 30, 1976	B 541,501	4,005,826	Apr. 13, 1976	Feb. 1, 1977
B 529,974	3,987,098	Feb. 17, 1976	Oct. 19, 1976	B 541,517	3,986,156	Jan. 13, 1976	Oct. 12, 1976
B 530,174	3,993,635	Feb. 24, 1976	Nov. 23, 1976	B 541,710	3,994,472	Feb. 24, 1976	Nov. 30, 1976
B 530,255	3,996,103	Mar. 2, 1976	Dec. 7, 1976	B 542,135	3,986,939	Feb. 10, 1976	Oct. 19, 1976
B 530,303	4,006,029	Mar. 23, 1976	Feb. 1, 1977	B 542,158	3,981,886	Jan. 13, 1976	Sep. 21, 1976
B 530,318	3,985,752	Jan. 13, 1976	Oct. 12, 1976	B 542,226	3,993,748	Feb. 24, 1976	Nov. 23, 1976
B 530,569	3,999,865	Mar. 16, 1976	Dec. 28, 1976	B 543,078	3,995,687	Feb. 17, 1976	Dec. 7, 1976
B 530,580	4,001,151	Mar. 2, 1976	Jan. 4, 1977	B 543,941	3,985,528	Jan. 13, 1976	Oct. 12, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 544,034	3,997,175	Feb. 17, 1976	Dec. 14, 1976	B 559,737	3,984,668	Jan. 20, 1976	Oct. 5, 1976
B 544,476	3,993,585	Feb. 24, 1976	Nov. 23, 1976	B 559,954	3,982,673	Feb. 3, 1976	Sep. 28, 1976
B 544,899	3,994,962	Feb. 17, 1976	Nov. 30, 1976	B 560,261	3,987,493	Mar. 16, 1976	Oct. 19, 1976
B 544,961	3,983,492	Jan. 13, 1976	Sep. 28, 1976	B 560,488	3,989,940	Mar. 16, 1976	Nov. 2, 1976
B 545,050	3,982,073	Jan. 20, 1976	Sep. 21, 1976	B 560,717	3,982,034	Feb. 10, 1976	Sep. 21, 1976
B 545,265	D 243,090	Apr. 13, 1976	Jan. 18, 1977	B 560,765	3,983,389	Feb. 3, 1976	Sep. 28, 1976
B 545,299	4,001,259	Feb. 24, 1976	Jan. 4, 1977	B 561,062	D 242,248	Feb. 10, 1976	Nov. 9, 1976
B 545,464	3,992,387	Feb. 10, 1976	Nov. 16, 1976	B 561,365	4,005,078	Apr. 13, 1976	Jan. 25, 1977
B 545,630	3,981,337	Jan. 27, 1976	Sep. 21, 1976	B 561,387	3,985,706	Feb. 10, 1976	Oct. 12, 1976
B 545,777	4,004,906	Jan. 27, 1976	Jan. 25, 1977	B 561,405	4,003,770	Mar. 30, 1976	Jan. 18, 1977
B 545,856	4,006,939	Mar. 30, 1976	Feb. 8, 1977	B 561,712	3,992,126	Feb. 17, 1976	Nov. 16, 1976
B 545,935	3,990,337	Jan. 27, 1976	Nov. 9, 1976	B 561,732	3,991,460	Feb. 3, 1976	Nov. 16, 1976
B 545,945	3,995,260	Jan. 27, 1976	Nov. 30, 1976	B 561,764	3,984,634	Jan. 27, 1976	Oct. 5, 1976
B 546,097	3,999,309	Mar. 23, 1976	Dec. 28, 1976	B 561,770	4,000,366	Mar. 16, 1976	Dec. 28, 1976
B 546,295	3,987,070	Jan. 20, 1976	Oct. 19, 1976	B 561,784	3,984,710	Jan. 27, 1976	Oct. 5, 1976
B 546,426	3,982,063	Jan. 27, 1976	Sep. 21, 1976	B 562,413	4,000,930	Mar. 16, 1976	Jan. 4, 1977
B 546,631	3,983,729	Feb. 3, 1976	Oct. 5, 1976	B 562,462	3,985,836	Jan. 13, 1976	Oct. 12, 1976
B 546,665	3,990,062	Jan. 20, 1976	Nov. 2, 1976	B 562,601	3,998,360	Mar. 16, 1976	Dec. 21, 1976
B 546,911	3,981,058	Jan. 13, 1976	Sep. 21, 1976	B 562,698	3,983,972	Jan. 13, 1976	Oct. 5, 1976
B 546,922	3,987,742	Mar. 16, 1976	Oct. 26, 1976	B 562,813	3,985,491	Feb. 3, 1976	Oct. 12, 1976
B 547,016	3,999,741	Mar. 23, 1976	Dec. 28, 1976	B 563,070	3,996,230	Mar. 9, 1976	Dec. 7, 1976
B 547,208	4,001,218	Feb. 24, 1976	Jan. 4, 1977	B 563,165	4,000,977	Mar. 9, 1976	Jan. 4, 1977
B 547,547	3,997,670	Feb. 24, 1976	Dec. 14, 1976	B 563,244	3,983,562	Jan. 27, 1976	Sep. 28, 1976
B 547,994	3,990,081	Jan. 20, 1976	Nov. 2, 1976	B 563,301	3,995,589	Feb. 17, 1976	Dec. 7, 1976
B 548,028	3,991,517	Feb. 3, 1976	Nov. 16, 1976	B 563,412	3,992,127	Feb. 24, 1976	Nov. 16, 1976
B 548,058	3,983,050	Feb. 17, 1976	Sep. 28, 1976	B 563,419	3,999,051	Mar. 23, 1976	Dec. 21, 1976
B 548,155	3,981,477	Jan. 13, 1976	Sep. 21, 1976	B 563,722	3,990,925	Jan. 13, 1976	Nov. 9, 1976
B 548,440	3,993,401	Feb. 3, 1976	Nov. 23, 1976	B 563,780	3,987,769	Feb. 3, 1976	Oct. 26, 1976
B 548,302	3,983,414	Feb. 17, 1976	Sep. 28, 1976	B 563,932	4,000,638	Mar. 23, 1976	Jan. 4, 1977
B 548,440	3,993,401	Feb. 3, 1976	Nov. 23, 1976	B 564,252	4,001,293	Mar. 2, 1976	Jan. 4, 1977
B 548,462	D 242,283	Feb. 10, 1976	Nov. 9, 1976	B 564,314	3,984,996	Jan. 20, 1976	Oct. 12, 1976
B 548,688	3,995,984	Mar. 9, 1976	Dec. 7, 1976	B 564,902	4,001,351	Mar. 23, 1976	Jan. 4, 1977
B 548,719	3,990,553	Feb. 17, 1976	Nov. 9, 1976	B 565,180	3,981,685	Jan. 27, 1976	Sep. 21, 1976
B 548,978	3,998,139	Mar. 9, 1976	Dec. 21, 1976	B 565,275	3,990,299	Apr. 6, 1976	Nov. 9, 1976
B 549,198	3,981,975	Jan. 13, 1976	Sep. 21, 1976	B 565,717	3,999,138	Apr. 13, 1976	Dec. 21, 1976
B 549,244	3,981,125	Jan. 27, 1976	Sep. 21, 1976	B 566,464	3,996,367	Feb. 3, 1976	Dec. 7, 1976
B 549,394	3,981,611	Jan. 27, 1976	Sep. 21, 1976	B 566,556	3,998,511	Mar. 23, 1976	Dec. 21, 1976
B 549,931	3,986,141	Jan. 20, 1976	Oct. 12, 1976	B 566,572	3,988,590	Mar. 16, 1976	Oct. 26, 1976
B 549,964	3,995,899	Feb. 24, 1976	Dec. 7, 1976	B 566,585	4,001,083	Mar. 2, 1976	Jan. 4, 1977
B 550,693	3,982,194	Jan. 20, 1976	Sep. 21, 1976	B 567,058	3,985,188	Jan. 13, 1976	Oct. 12, 1976
B 550,744	3,993,550	Feb. 17, 1976	Nov. 23, 1976	B 567,158	3,988,073	Mar. 23, 1976	Oct. 26, 1976
B 550,810	4,000,910	Mar. 23, 1976	Jan. 4, 1977	B 567,207	3,991,689	Apr. 13, 1976	Nov. 16, 1976
B 551,133	3,996,740	Mar. 2, 1976	Dec. 14, 1976	B 567,435	3,995,724	Feb. 3, 1976	Dec. 7, 1976
B 551,463	3,996,254	Feb. 17, 1976	Dec. 7, 1976	B 567,854	3,985,038	Feb. 3, 1976	Oct. 12, 1976
B 551,527	3,982,599	Jan. 13, 1976	Sep. 28, 1976	B 567,892	4,000,855	Mar. 16, 1976	Jan. 4, 1977
B 551,809	3,996,743	Feb. 24, 1976	Dec. 14, 1976	B 568,226	3,992,698	Feb. 24, 1976	Nov. 16, 1976
B 551,952	Re. 29,059	Mar. 2, 1976	Dec. 7, 1976	B 568,770	3,982,213	Feb. 10, 1976	Sep. 21, 1976
B 552,006	3,992,129	Feb. 3, 1976	Nov. 16, 1976	B 569,125	3,986,980	Feb. 24, 1976	Oct. 19, 1976
B 552,489	3,994,864	Feb. 10, 1976	Nov. 30, 1976	B 569,293	4,004,149	Mar. 30, 1976	Jan. 18, 1977
B 552,498	3,983,139	Jan. 13, 1976	Sep. 28, 1976	B 569,501	3,999,250	Mar. 9, 1976	Dec. 28, 1976
B 552,508	4,001,250	Mar. 16, 1976	Jan. 4, 1977	B 569,519	3,993,133	Feb. 3, 1976	Nov. 23, 1976
B 552,629	3,994,773	Mar. 23, 1976	Nov. 30, 1976	B 569,646	3,985,222	Jan. 13, 1976	Oct. 12, 1976
B 552,709	4,001,467	Mar. 23, 1976	Jan. 4, 1977	B 569,859	3,994,160	Mar. 9, 1976	Nov. 30, 1976
B 552,932	3,989,292	Feb. 3, 1976	Nov. 2, 1976	B 570,172	3,987,763	Feb. 3, 1976	Oct. 26, 1976
B 553,421	4,001,146	Mar. 23, 1976	Jan. 4, 1977	B 570,615	3,998,570	Mar. 23, 1976	Dec. 21, 1976
B 553,460	3,990,019	Feb. 3, 1976	Nov. 2, 1976	B 570,862	3,991,639	Feb. 24, 1976	Nov. 16, 1976
B 553,584	3,992,456	Feb. 17, 1976	Nov. 16, 1976	B 571,219	3,991,388	Feb. 24, 1976	Nov. 9, 1976
B 553,629	3,999,242	Feb. 24, 1976	Dec. 28, 1976	B 571,638	4,001,244	Mar. 9, 1976	Jan. 4, 1977
B 554,039	3,999,944	Feb. 24, 1976	Dec. 28, 1976	B 571,659	3,995,186	Apr. 13, 1976	Nov. 30, 1976
B 554,164	4,001,465	Mar. 9, 1976	Jan. 4, 1977	B 572,642	3,990,715	Feb. 10, 1976	Nov. 9, 1976
B 554,283	3,981,152	Jan. 27, 1976	Sep. 21, 1976	B 573,033	3,995,224	Mar. 23, 1976	Nov. 30, 1976
B 554,291	4,001,209	Mar. 9, 1976	Jan. 4, 1977	B 573,994	4,000,641	Mar. 23, 1976	Jan. 4, 1977
B 554,380	4,001,147	Mar. 9, 1976	Jan. 4, 1977	B 574,128	3,982,961	Feb. 17, 1976	Sep. 28, 1976
B 554,594	3,985,960	Jan. 20, 1976	Oct. 12, 1976	B 574,616	4,000,424	Mar. 2, 1976	Dec. 28, 1976
B 554,848	4,001,265	Feb. 24, 1976	Jan. 4, 1977	B 574,996	3,989,718	Feb. 17, 1976	Nov. 2, 1976
B 554,939	3,994,013	Feb. 10, 1976	Nov. 23, 1976	B 575,583	4,000,928	Mar. 16, 1976	Jan. 4, 1977
B 555,437	3,991,152	Feb. 3, 1976	Nov. 9, 1976	B 575,757	3,981,170	Jan. 27, 1976	Sep. 21, 1976
B 555,456	3,993,423	Mar. 30, 1976	Nov. 23, 1976	B 575,851	3,985,826	Feb. 10, 1976	Oct. 12, 1976
B 555,772	3,982,641	Jan. 13, 1976	Sep. 28, 1976	B 576,859	3,991,526	Feb. 24, 1976	Nov. 16, 1976
B 556,057	3,985,349	Jan. 13, 1976	Oct. 12, 1976	B 576,903	3,995,032	Feb. 3, 1976	Nov. 30, 1976
B 556,496	3,990,244	Mar. 16, 1976	Nov. 9, 1976	B 578,447	3,982,658	Jan. 20, 1976	Sep. 28, 1976
B 556,897	3,992,972	Feb. 3, 1976	Nov. 23, 1976	B 579,104	3,982,081	Jan. 27, 1976	Sep. 21, 197
B 557,153	3,991,603	Feb. 3, 1976	Nov. 16, 1976	B 579,116	3,986,227	Feb. 3, 1976	Oct. 19, 1976
B 557,299	3,990,357	Feb. 3, 1976	Nov. 9, 1976	B 579,806	3,995,318	Feb. 3, 1976	Nov. 30, 1976
B 557,621	3,990,800	Feb. 3, 1976	Nov. 9, 1976	B 580,379	4,000,796	Apr. 6, 1976	Jan. 4, 1977
B 557,856	3,991,019	Feb. 10, 1976	Nov. 9, 1976	B 580,826	3,988,391	Feb. 17, 1976	Oct. 26, 1976
B 558,220	3,990,009	Jan. 27, 1976	Nov. 2, 1976	B 580,921	3,984,054	Jan. 13, 1976	Oct. 5, 1976
B 558,251	3,981,289	Jan. 13, 1976	Sep. 21, 1976	B 581,843	4,000,562	Mar. 16, 1976	Jan. 4, 1977
B 558,813	3,989,188	Feb. 3, 1976	Nov. 2, 1976	B 583,051	3,990,714	Feb. 3, 1976	Nov. 9, 1976
B 558,818	3,983,762	Jan. 13, 1976	Oct. 5, 1976	B 583,089	3,982,174	Jan. 27, 1976	Sep. 21, 1976
B 558,819	3,990,160	Feb. 3, 1976	Nov. 9, 1976	B 583,712	3,995,064	Feb. 10, 1976	Nov. 30, 1976
B 558,973	3,981,126	Feb. 10, 1976	Sep. 21, 1976	B 584,520	3,981,149	Jan. 27, 1976	Sep. 21, 1976
B 559,111	3,984,854	Feb. 24, 1976	Oct. 5, 1976	B 584,997	4,000,030	Mar. 9, 1976	Dec. 28, 1976
B 559,142	4,001,124	Mar. 2, 1976	Jan. 4, 1977	B 585,247	3,989,914	Feb. 3, 1976	Nov. 2, 1976
B 559,697	3,995,770	Mar. 16, 1976	Dec. 7, 1976	B 585,731	3,993,603	Feb. 3, 1976	Nov. 23, 1976
B 559,700	4,001,189	Mar. 23, 1976	Jan. 4, 1977	B 586,215	3,985,302	Jan. 20, 1976	Oct. 12, 1976
B 559,701	4,001,190	Mar. 23, 1976	Jan. 4, 1977	B 586,380	3,983,885	Mar. 2, 1976	Oct. 5, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 586,387	3,981,311	Feb. 3, 1976	Sep. 21, 1976	B 592,146	4,001,084	Mar. 2, 1976	Jan. 4, 1977
B 586,663	3,992,080	Feb. 3, 1976	Nov. 16, 1976	B 592,658	4,001,164	Mar. 23, 1976	Jan. 4, 1977
B 587,118	Re. 29,067	Mar. 2, 1976	Dec. 7, 1976	B 594,871	3,999,245	Mar. 16, 1976	Dec. 28, 1976
B 587,786	3,991,204	Feb. 17, 1976	Nov. 9, 1976	B 596,692	3,992,349	Feb. 17, 1976	Nov. 16, 1976
B 587,936	3,999,052	Mar. 23, 1976	Dec. 21, 1976	B 597,410	4,000,925	Mar. 30, 1976	Jan. 4, 1977
B 589,179	4,001,102	Mar. 23, 1976	Jan. 4, 1977	B 657,438	3,985,701	Jan. 20, 1976	Oct. 12, 1976
B 589,687	3,995,349	Mar. 23, 1976	Dec. 7, 1976	B 747,785	3,981,899	Feb. 10, 1976	Sep. 21, 1976
B 589,966	3,985,828	Feb. 17, 1976	Oct. 12, 1976	B 750,679	4,007,049	Mar. 23, 1976	Feb. 8, 1977
B 590,158	3,985,163	Feb. 10, 1976	Oct. 12, 1976	B 843,038	3,981,785	Feb. 3, 1976	Sep. 21, 1976
B 590,159	3,985,164	Feb. 3, 1976	Oct. 12, 1976	B 845,044	4,001,338	Mar. 30, 1976	Jan. 4, 1977
B 590,502	4,001,171	Mar. 23, 1976	Jan. 4, 1977	B 848,336	3,993,752	Mar. 30, 1976	Nov. 23, 1976
B 592,143	3,984,713	Jan. 27, 1976	Oct. 5, 1976				

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 8TH DAY OF FEBRUARY, 1977

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Alvino, William M.: *See*—
Edelman, Leonard E.; and Alvino, William M., Re. 29,134.

Edelman, Leonard E.; and Alvino, William M., to Westinghouse Electric Corporation. Polyimide precursor and method and composition for preparing it. Re. 29,134, Cl. 260-47.0CB.

General Corporation, The: *See*—
Sugihara, Yasumasa, Re. 29,135.

Hudson, Willard G.: *See*—
Snellman, Donald L.; and Hudson, Willard G., Re. 29,133.

Norfin, Inc.: *See*—
Snellman, Donald L.; and Hudson, Willard G., Re. 29,133.

Snellman, Donald L.; and Hudson, Willard G., to Norfin, Inc. Constant length composite glass fiber cable under varying temperature conditions. Re. 29,133, Cl. 57-140.00G.

Sugihara, Yasumasa, to General Corporation, The. Sequential to simultaneous conversion system. Re. 29,135, Cl. 358-11.000.

Westinghouse Electric Corporation: *See*—
Edelman, Leonard E.; and Alvino, William M., Re. 29,134.

LIST OF PLANT PATENTEES

Byrum, Roy L., to Joseph H. Hill Company. Yellow rose plant. 4,015, 2-8-77, Cl. 15.000.

Byrum, Roy L., to Joseph H. Hill Company. Rose plant. 4,016, 2-8-77, Cl. 25.000.

Joseph H. Hill Company: *See*—
Byrum, Roy L., 4,015.
Byrum, Roy L., 4,016.

LIST OF DESIGN PATENTEES

Allard, Peter B., to Introl Corporation. Housing for fence charger. 243,344, 2-8-77, Cl. D26-5.00R.

American Standard, Inc.: *See*—
Stairs, Henry M., Jr., 243,334.

Bartlett, Robert N., to Windsor Industries, Inc. Hot water extraction-type carpet cleaning machine. 243,311, 2-8-77, Cl. D15-53.000.

Beduhn, Jack K.: *See*—
Clayton, Richard G.; Blue, John M.; Beduhn, Jack K.; and Guetschoff, Norman P., Jr., 243,340.

Beeren, Aloysius Jacobus Maria, to U.S. Philips Corporation. Electronic flash unit. 243,327, 2-8-77, Cl. D16-42.000.

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Langlie, Howard; and Berg, Albert T., Jr. Nail-on electric fence insulator. 243,342, 2-8-77, Cl. D26-10.000.
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Scheimberg, Horatio. Adjusted suspender. 243,293, 2-8-77, Cl. D2-404.000.
Schellens, Henricus Franciscus Theresia; and Speakman, John Collyer, to U.S. Philips Corporation. Pocket dictating machine. 243,345, 2-8-77, Cl. D26-14.00B.
Segal, David. Smoking pipe, or similar article. 243,347, 2-8-77, Cl. D27-3.000.
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Smith, James F. Tamping device. 243,315, 2-8-77, Cl. D8-77.000.
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Taylor, James M., to Wishbone Marine Products Inc. Anchor. 243,324, 2-8-77, Cl. D12-215.000.
Thaheld, Fred A.; and Thaheld, Fred H., to Rumplestiltskin's Craft Shop, Inc. Hand powered tufting machine. 243,294, 2-8-77, Cl. D3-19.00R.
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CLASSIFICATION OF PATENTS

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166 A	4,006,769
263	4,006,770
378	4,006,771

CLASS 162

30 K	4,007,082
101	4,007,083
167	4,007,084

CLASS 164

66	4,006,772
298	4,006,773
312	4,006,774

CLASS 165

51	4,006,775
166	4,006,776

CLASS 166

250	4,006,777
261	4,006,778
275	4,006,779

CLASS 169

26	4,006,780

CLASS 172

532	4,006,781

806 4,006,782

CLASS 173

12 4,006,783
4,006,784
4,006,785
15 4,006,786
132 4,006,787

CLASS 175

330 4,006,788

CLASS 176

80 4,007,085

CLASS 177

126 4,006,789

CLASS 178

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4,007,331

CLASS 179

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6 D 4,007,333
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16 AA 4,007,335
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170.2 4,007,341

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108 4,006,791
143 4,006,792

CLASS 181

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115 4,006,794
121 4,006,795
130 4,006,796

CLASS 184

27 R 4,006,797

CLASS 186

1 C 4,006,798

CLASS 187

38 4,006,799

CLASS 188

72.7 4,006,800
196 BA 4,006,801
196 D 4,006,802
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CLASS 198

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488 4,006,813
577 4,006,814
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853 4,006,817

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159 R 4,007,347
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CLASS 201

17 4,007,092

CLASS 202

121 4,007,093
174 4,007,094

CLASS 203

59 4,007,095

CLASS 204

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15 4,007,097
55 R 4,007,098
140 4,007,099
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195 S 4,007,106
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290 F 4,007,107

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219 4,006,820
379 4,006,821
424 4,006,822
554 4,006,823
564 4,006,818

CLASS 208

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350 4,007,112

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201 4,006,827

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1 P 4,006,828
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776 4,006,834

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340 4,006,837

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PLANT PATENTS

18	:	4,015			4,016						

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U.S. DEPARTMENT OF COMMERCE
Juanita M. Kreps, *Secretary*

PATENT AND TRADEMARK OFFICE
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